MDS-303

SERVICE MANUAL

AEP Model
UK Model

Model Name Using Similar Mechanism	MDS-302
Mechanism Type	MDM-2A
Base Unit Type	MBU-2
Optical Pick-up Block Type	KMS-210A/J-N

SPECIFICATIONS

MD deck section

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser (λ=780 nm) Emission duration: continuous
Laser output power	Less than 44.6 μW* * This output is the value measured at a distance of 200 mm from the objective lens surface on the optical pick-up block with 7 mm aperture.
Laser diode properties	Material: GaAlAs
Revolutions (CLV)	400 rpm to 900 rpm
Error correction	Advanced Cross Interleave Reed Solomon Code (ACIRC)
Sampling frequency	44.1 kHz
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz ±0.5 dB
Signal-to-noise ratio (during playback)	Over 96 dB
Wow and flutter	Below measurable limit

Inputs

	Jack type	Input impedance	Rated input	Minimum input
LINE (ANALOG) IN	Phono jacks	47 kilohms	500 mVrms	125 mVrms
DIGITAL IN	Square optical connector jack	Optical wave lenghth 660 nm	—	—

Outputs

	Jack type	Rated output	Load impedance
PHONES	Stereo phone jack	10 mW	32 ohms
LINE (ANALOG) OUT	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OUT	Square optical connector jack	−18 dBm	Wave length: 660 nm

— Continued on next page —

使用時は添付資料も参照のこと
Refer to the additional documents.

MINIDISC DECK

SONY®

General

Power requirements

Where purchased	Power requirements
AEP	220 - 230 V AC, 50/60 Hz
UK	220 - 240 V AC, 50/60 Hz

Power consumption 20 W

Dimensions (approx) (w/h/d) incl. projecting parts
UK model: 430 x 97.5 x 303 mm
AEP model 430 x 97.5 x 292 mm
(17 x 3 7/8 x 11 1/2 in.)

Mass (approx) 3.6 kg (7 lbs 15 oz)

Supplied accessories

- Audio connecting cords (2)
- Optical cable (1)
- Remote commander (remote) (1)
  RM-D4M
- Sony SUM-3 (NS) batteries (2)

U.S. and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Design and specifications are subject to change without notice.

TABLE OF CONTENTS

Section Title Page

SECTION 1. GENERAL 4

SECTION 2. DISASSEMBLY
2-1. Case 19
2-2. Front Panel Assembly 19
2-3. Mechanism Deck 20
2-4. Slider Assembly 20
2-5. Base Unit and Loading Motor Assembly 21
2-6. Slider Assembly Mounting 21

SECTION 3. TEST MODE
3-1. Setting the Test Mode 22
3-2. Exiting the Test Mode 22
3-3. Basic Operations of the Test Mode 22
3-4. Selecting the Test Mode 22
3-4-1. Operating the Continuous Playback Mode 22
3-4-2. Operating the Continuous Recording Mode 23
3-4-3. Non-Volatile Memory Mode 23
3-5. Functions of Other keys 23
3-6. Test Mode Displays 24
3-7. Meanings of Other Displays 24
3-8. Precautions for Use of Test Mode 24

SECTION 4. ELECTRICAL ADJUSTMENTS
4-1. Precautions for Checking Laser Diode Emission 25
4-2. Precautions for Use of optical pickup (KMS-210A) 25
4-3. Precautions for Adjustments 25
4-4. Creating MO Continuously Recorded Disc 25
4-5. Temperature Compensation Offset Adjustment 26
4-6. Laser Power Adjustment 26
4-7. Traverse Adjustment 27
4-8. Focus Bias Adjustment 28
4-9. Error Rate Check 28
4-9-1. CD Error Rate Check 28
4-9-2. MO Error Rate Check 28
4-10. Focus Bias Check 28
4-11. Adjusting Points and Connecting Points 29

SECTION 5. DIAGRAMS
5-1. Circuit Boards Location 30
5-2. Block Diagram 31
5-3. Printed Wiring Boards — RF Section — 36
5-4. Schematic Diagram — RF Section — 39
5-5. Schematic Diagram — Digital Section — 43
5-6. Printed Wiring Boards — Digital Section — 47
5-7. Schematic Diagram — Display/Power Section — 51
5-8. Printed Wiring Boards — Display/Power Section — 55
5-9. IC Pin Functions
• IC101 RF AMP (CXA1981R) 58
• IC121 Digital Signal Processor, Digital Servo Signal Processor, EFM/ACIRC Encoder/ Decoder (CXD2535AR) 59
• IC201 System Controller (M37610MD-052FP) 62
• IC271 Shock-Proof Memory controller, ATRAC Encoder/ Decoder (CXD2536R) 65

SECTION 6. EXPLODED VIEWS
6-1. Case and Front Panel Section 68
6-2. Chassis Section 69
6-3. Mechanism Section (MDM-2A) 70
6-4. Base Unit Section (MBU-2) 71

SECTION 7. ELECTRICAL PARTS LIST 72

The laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

The following caution label is located inside of the unit.

CAUTION	:	INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL:		USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	:	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA LASERSÄTEILYLLE.
VARNING	:	LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD.
ADVERSEL:		USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

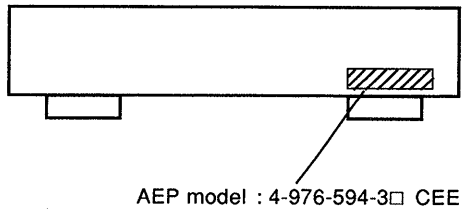
- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor ofthe circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MODEL IDENTIFICATION

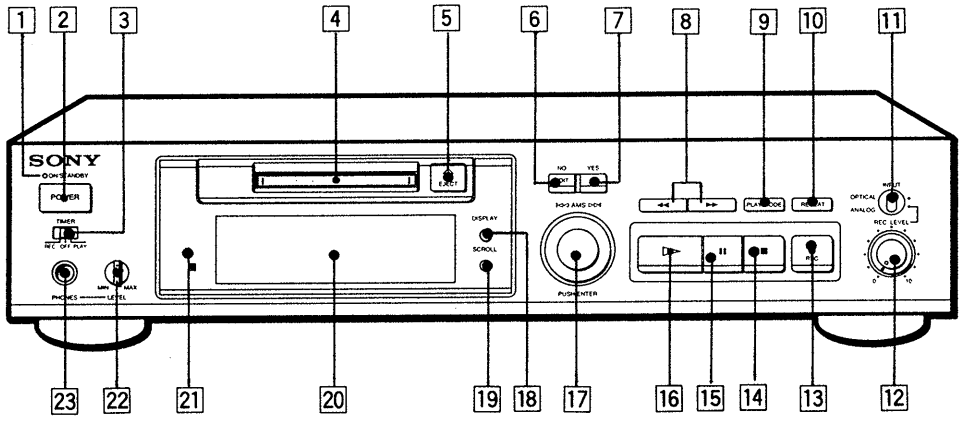
— BACK PANEL —



AEP model : 4-976-594-3□ CEE
UK model : 4-976-594-4□ CEK

SECTION 1
GENERAL

FRONT PANEL

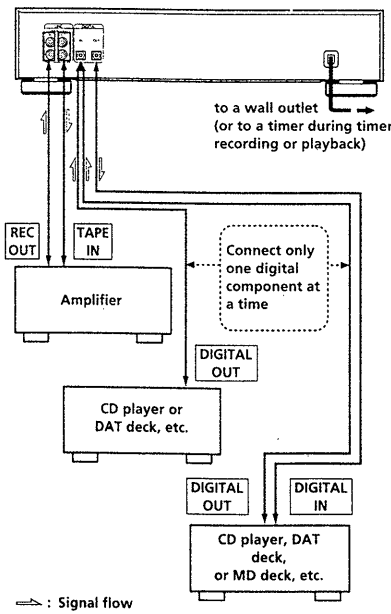


1 ON/STANDBY indicator
2 POWER switch
3 TIMER switch
4 Disc compartment
5 ⏏ EJECT button
6 EDIT NO button
7 EDIT YES button
8 ◄◄/►► (search) buttons
9 PLAY MODE button
10 REPEAT button
11 INPUT selector switch
12 REC (recording) LEVEL control
13 ● REC (recording) button
14 ■ (stop) button
15 ❚❚ (pause) button
16 ▷ (play) button
17 ⏮ AMS ⏭ knob
18 DISPLAY button
19 SCROLL button
20 Display window
21 Remote sensor
22 PHONE LEVEL control
23 PHONES jack

Hooking Up the System

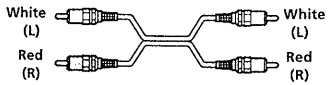
Overview

This section describes how to hook up the MD deck to an amplifier or other components such as a CD player or DAT deck. Be sure to turn off the power of each component before connection.

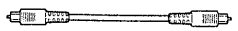

to a wall outlet
(or to a timer during timer recording or playback)
REC OUT
TAPE IN
Amplifier
Connect only one digital component at a time
DIGITAL OUT
CD player or DAT deck, etc.
DIGITAL OUT
DIGITAL IN
CD player, DAT deck, or MD deck, etc.
: Signal flow

What cords will I need?

- Audio connecting cords (supplied) (2)



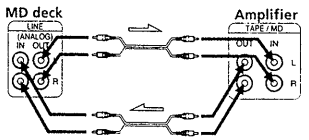
- Optical cable (only one supplied) (2)



Hookups

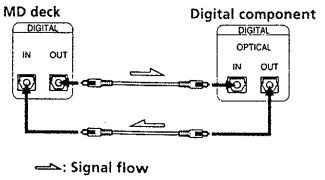
Connecting the deck to an amplifier

Connect the amplifier to the LINE (ANALOG) IN/OUT jacks using the audio connecting cords (supplied), making sure to match the color-coded cords to the appropriate jacks on the components: red (right) to red and white (left) to white. Be sure to make connections firmly to prevent hum and noise.



Connecting the deck to a digital component such as a CD player, DAT deck, digital amplifier, or another MD deck

Connect the component through the DIGITAL IN/OUT connectors with two optical cables (only one supplied). Take the caps off the connectors before plugging in the cables.



Notes

- Digital program sources with different sampling frequencies cannot be recorded through the digital input connector.
  Only CD, MD (premastered) and DAT sources with a sampling frequency of 44.1 kHz can be recorded through the digital input connector. "Din Unlock" appears in the display when you attempt to record digital program sources with a sampling frequency different from that of the MD (such as 32- or 48-kHz DAT or BS). To record these program sources on an MD you must connect them through the LINE (ANALOG) IN jacks and set INPUT to ANALOG.
- If "Cannot Copy" appears in the display, recording through the digital connector is not possible.
  In this case, record the program source through the LINE (ANALOG) IN jacks with INPUT set to ANALOG.
- When recording through the DIGITAL IN connector, you cannot adjust the recording level.

Connecting the AC power cord

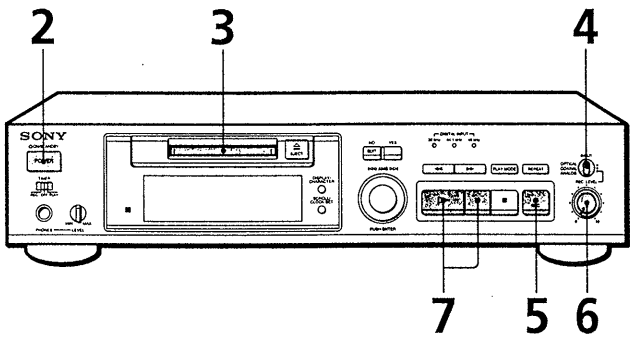
Connect the AC power cord to a wall outlet or to the outlet of a timer.

Note

With the exception of a timer outlet, do not connect the AC power cord to a switched outlet.

This section is extracted from instruction manual.

Recording on an MD

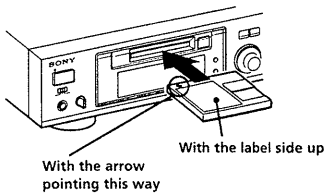


1 Turn on the amplifier and play the program source you want to record.

2 Press POWER.

The ON/STANDBY indicator changes from red to green.

3 Insert a recordable MD.



If the MD has a recorded material on it, the deck will automatically start recording from the end of the last recorded track.

4 Set INPUT to the corresponding input connector.

To record through	Set INPUT to
DIGITAL IN	DIGITAL
LINE (ANALOG) IN	ANALOG

When "TOC" flashes in the display

The deck is currently updating the Table Of Contents (TOC).
Do not move the deck or pull out the AC power cord . Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing POWER.

5 Press ● REC.

The deck becomes ready to record.

6 When recording the analog input signal, adjust the recording level with REC LEVEL.

The fourth dot is satisfactory for most purposes. For details, refer to "Adjusting the Recording Level" on page 13.

7 Press ▷ or ❚❚.

Recording starts.

8 Start playing the program source.

Do not disconnect the deck from the power source immediately after recording

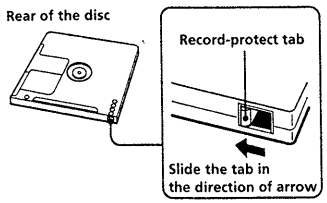
If you do, recorded material may not be saved to the MD. To save the material, after recording, press ⏏ EJECT to take out the MD or change the deck to standby by pressing POWER. "TOC" will flash in the display at this time. After "TOC" stops flashing and goes out, you can pull out the AC power cord.

To	Press
Stop recording	■
Pause recording*	❚❚. Press the button again or press ▷ to resume recording.
Take out the MD	⏏ EJECT after stopping recording

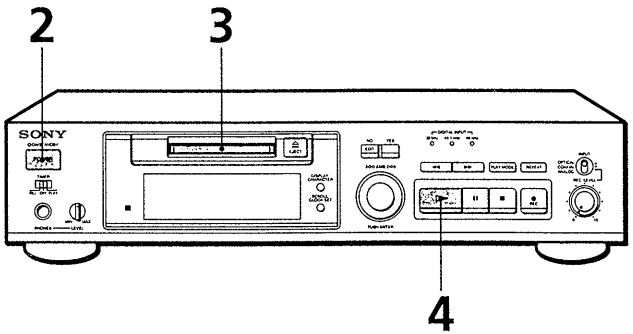
* Whenever you pause recording, the track number increases by one. For example, if you paused recording while recording on track 4, the track number increases by one and recording continues on the new track when restarted.

To protect an MD against accidental erasure

To make it impossible to record on an MD, slide the tab in the direction of arrow, opening the slot. To allow recording, close the slot.



Playing an MD

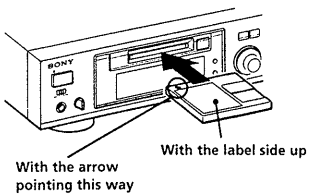


1 Turn on the amplifier and set the source selector to the position for MD deck.

2 Press POWER.

The ON/STANDBY indicator changes from red to green.

3 Insert an MD.



4 Press ▷.

The deck starts playing. Adjust the volume on the amplifier.

To	Do the following:
Stop playing	Press ■.
Pause playing	Press ❚❚. Press the button again or press ▷ to resume playing.
Go to the next track	Turn AMS clockwise (or press ▶▶| on the remote).
Go to the preceding track	Turn AMS counterclockwise (or press |◀◀ on the remote).
Take out the MD	Press ⏏ EJECT after stopping playing.

You can locate and play back a track while the deck is stopped

1 Turn AMS (or press |◀◀ or ▶▶|) until the number of the track you want to play appears.
2 Press AMS or ▷

To use headphones

Connect them to PHONES jack. Use PHONE LEVEL to adjust the volume.

Notes on Recording

If "Protected" appears in the display

The MD is record-protected. Close the slot to record on the disc (see "To protect an MD against accidental erasure" on page 9).

If "Din Unlock" flashes in the display

- The program source is not connected to the respective digital input connector even though you've selected a digital input source in Step 4 on page 8. To continue, connect the respective digital input connector to the program source or set INPUT to ANALOG to record through LINE (ANALOG) IN.
- The digital signal has been interrupted (stopped) while you were recording. To continue recording, restart the digital program source. To stop recording, press ■ on the MD deck.

Depending on source being recorded, track numbers are marked in following ways:

- When recording from a CD or MD with INPUT set to digital input and the source connected through the respective digital input connector:
  The deck automatically marks track numbers in the same sequence as the original. If, however, a track is repeated two or more times (e.g. by single-track repeat play) or two or more tracks with the same track number (e.g. from different MDs or CDs) are played, the track or tracks are recorded as part of a single, continuous track with a single track number.
  If the source is an MD, track numbers may not be marked for tracks of less than 4 seconds.
- When recording from source connected through LINE (ANALOG) IN with INPUT at ANALOG, and "LEVEL SYNC" does not light up (see "Marking Track Numbers While Recording" on page 14) or when recording from DAT or satellite broadcasts connected through a digital input cable with INPUT set to digital input:
  The source will be recorded as a single track. You can divide the track afterwards using the Divide Function (see "Dividing Recorded Tracks" on page 26) or mark track numbers during recording by using the Track Marking Function on page 14.
  If "LEVEL SYNC" appears in the display, the deck automatically marks track numbers when recording analog source or digital recording of DAT or satellite broadcasts (see "Marking track numbers automatically" on page 14).
- When recording from DAT or satellite broadcasts with INPUT set to digital input, the deck automatically marks a track number whenever the sampling frequency of the input signal changes.

When "TOC" flashes in the display

The deck is currently updating the Table Of Contents (TOC). Do not move the deck or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing POWER.

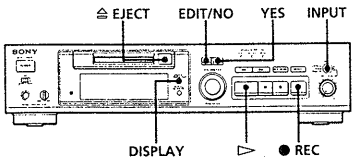
The MD deck uses the SCMS (Serial Copy Management System on page 34)

MDs recorded through digital input connector cannot be copied onto other MDs or DAT tapes through the digital output connector.

When recording digital signals that have been emphasized (in the higher frequencies)

The signal is automatically de-emphasized (with attenuation proportional to the degree of emphasis) and the level of the de-emphasized signal is indicated on the peak level meters.

Useful Tips for Recording



Checking the remaining recordable time on the MD

- When you press DISPLAY while recording, the remaining recordable time on the MD appears.
- When you press DISPLAY repeatedly while the deck is stopped, the display changes as follows: total recorded time, remaining recordable time on the MD, disc name (see page 18).

If "Auto Cut" appears in the display (Auto Cut)

There has been no sound input for 30 seconds while INPUT is set to digital input and the source is connected through the respective digital input connector. The 30 seconds of silence are replaced by a blank of about 3 seconds and the deck changes to recording pause.

If "Smart Space" appears in the display (Smart Space)

There has been an extended silence of 4 to 30 seconds in length when INPUT is set to digital input and the source is connected through the respective digital input connector. The silence is replaced with a blank of about 3 seconds and the deck continues recording.

Playing back tracks just recorded

Do this procedure to immediately playback tracks that have just been recorded.

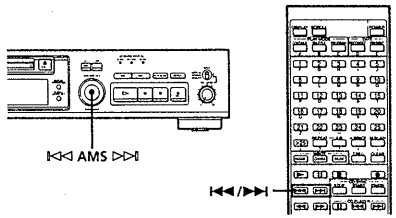
Press ▷ immediately after stopping recording. Playback starts from the first track of the material just recorded.

To play from the first track of the MD after recording

1 Press ■ again after stopping recording.
2 Press ▷.
Playback starts from the first track of the MD.

Recording Over Existing Tracks

Follow the procedure below to record over existing material just as you would on an analog cassette tape.



1 Do Steps 1 to 4 in "Recording on an MD" on page 8.

2 Turn AMS (or press I◄◄ or ►►I) until the number of the track to be recorded over appears.

3 To record from the start of the track, continue from Step 5 in "Recording on an MD" on page 9.

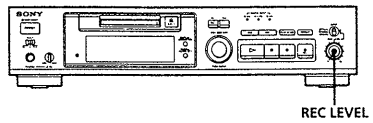
While "TRACK" flashes in the display
The deck is recording over an existing track, and stops flashing when it reaches the end of the recorded portion.

To record from the middle of the track
1 After Step 2 above, press ▷ to start playback.
2 Press II where you want to start recording.
3 Continue from Step 5 in "Recording on an MD" on page 9.

Note
You cannot record from the middle of an existing track when the "PROGRAM" or "SHUFFLE" is on.

Adjusting the Recording Level

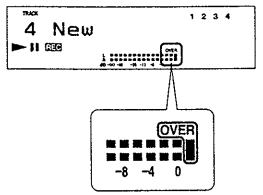
When recording with INPUT at ANALOG and the signal input through LINE (ANALOG) IN jacks, use REC LEVEL to adjust the recording level before starting recording.
You cannot adjust the recording level during digital recording.



1 Do Steps 1 to 5 in "Recording on an MD" on pages 8 and 9.

2 Play the portion of the program source with the strongest signal level.

3 While monitoring the sound, turn REC LEVEL to adjust the recording level so that the peak level meters reach their highest point without turning on the OVER indication. Occasional lighting of "OVER" is acceptable.

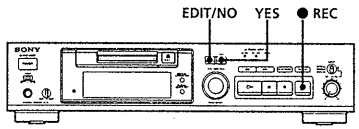


4 Stop playing the program source.

5 To start recording, do the procedure starting from Step 7 in "Recording on an MD" on page 9.

Marking Track Numbers While Recording (Track Marking)

You can mark track numbers either manually or automatically. By marking track numbers at specific points, you can quickly locate the points later using the AMS Function or Editing Functions.



Marking track numbers manually (Manual Track Marking)

You can mark track numbers at any time while recording on an MD.

Press ● REC at the place you want to add a track mark while recording.

Marking track numbers automatically (Automatic Track Marking)

The deck adds track marks differently in the following cases:

- When recording from CDs or MDs with INPUT set to digital input and the source connected through the respective digital input connector:
  The deck marks track numbers automatically. When you record from a CD or MD, the track numbers are marked as they are found on the original.
- When recording with INPUT at ANALOG and the source connected through LINE (ANALOG) IN, or when recording from DAT or satellite broadcasts with INPUT set to digital input and the DAT or satellite broadcasts connected through the respective digital input connector:
  The deck marks a new track number whenever the signal level drops and rises to a certain point* (Automatic Track Marking). If "LEVEL SYNC" does not light up, set the LevelSync to ON as follows:

1 Press EDIT/NO to display "LevelSync ?"during recording or recording pause.

2 Press YES twice to display "LevelSync ON." "LEVEL SYNC" appears in the display.

To cancel Automatic Track Marking

1 Press EDIT/NO during recording or recording pause. "LevelSync ?" appears in the display.
2 Press YES.
3 Press EDIT/NO. "LevelSyncOFF" appears in the display.

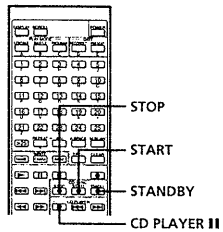
* The signal level must remain low for 2 or more seconds before a new track number is marked.

When you want to mark track numbers after you've finished recording
Use the Divide Function (see "Dividing Recorded Tracks" on page 26).

Note
If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting (LevelSync on or off) of the Automatic Track Marking Function the next time you turn on the deck.

Synchro-Recording With a Sony CD Player

By connecting your deck to a Sony CD player or Hi-Fi Component System, you can easily dub CDs onto MDs using the CD synchro buttons on the remote. If your deck is connected to a Sony CD player by a digital input cable, track numbers are automatically marked as appear on the original regardless of whether "LevelSync ON" or "LevelSyncOFF" is selected. If your deck is connected to a Sony CD player by audio connecting cords through LINE (ANALOG) IN, track numbers are automatically marked when you select "LevelSync ON" (see "Marking Track Numbers While Recording" on page 14).
As the same remote controls both the CD player and the deck, you may have trouble operating both units if they are far from each other. If you do, place the CD player close to this deck.



1 Set the source selector on the amplifier to CD.

2 Do Steps 2 to 4 in "Recording on an MD" on page 8 to prepare the deck for recording.

3 Insert a CD into the CD player.

4 Select the playback mode (Shuffle Play, Program Play, etc.) on the CD player.

5 Press STANDBY.
The CD player pauses for playing and the deck pauses for recording.

6 Press START.
The deck starts recording and the CD player starts playback.
The track number and elapsed recording time of the track appear in the display.

If the CD player does not start playing
Some CD player models may not respond when you press START on the remote of the deck. Press II on the remote of the CD player instead.

7 Press STOP to stop synchro-recording.

To pause recording
Press STANDBY or CD PLAYER II.
To restart recording, press START or CD PLAYER II.
A new track number is marked each time you pause recording.

You can use the remote of the CD player during synchro-recording
When you press ■, the CD player stops and the deck pauses for recording.
When you press II, the CD player pauses and the deck pauses for recording.
To restart synchro-recording, press ▷.

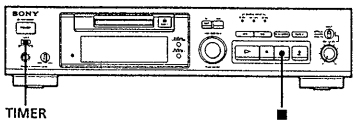
You can change CDs during synchro-recording
Do the following steps instead of Step 7 above.
1 Press ■ on the remote of the CD player. The deck pauses for recording.
2 Change the CD.
3 Press ▷ on the remote of the CD player. Synchro-recording restarts.

You can also do synchro-recording with a Sony video CD player
Using the procedure for synchro-recording with a Sony CD player, you can do synchro-recording with a Sony video CD player also.
To select the video CD player, press button number 2 while pressing down the POWER button before starting the procedure.
To select the CD player again, press button number 1 while pressing down the power button.
The deck is factory set to a CD player for synchro-recording.

You can check the remaining recordable time on the MD
Press DISPLAY (see page 11).

Recording on an MD Using a Timer

By connecting a timer (not supplied) to the deck, you can start and stop recording operations at specified times. For further information on connecting the timer and setting the starting and ending times, refer to the instructions that came with the timer.



1 Do Steps 1 to 6 in "Recording on an MD" on pages 8 and 9.

2
- If you want to specify the time for the start of recording, press ■.
- If you want to specify the time for the end of recording, do Steps 7 and 8 of "Recording on an MD" on page 9.
- If you want to specify the time for both start and end of recording, press ■.

3 Set TIMER on the deck to REC.

4 Set the timer as required.
- When you have set the time for the start of recording, the deck turns off. When the specified time arrives, the deck turns on and starts recording.
- When you have set the time for the end of recording, recording continues. When the specified time arrives, the deck stops recording and turns off.
- When you have set the time for both the start and end of recording, the deck turns off. When the starting time arrives, the deck turns on and starts recording. When the ending time arrives, the deck stops recording and turns off.

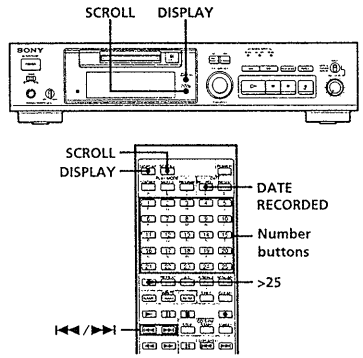
5 After you have finished using the timer, set TIMER on the deck to OFF. Then place the deck in standby status by plugging the AC power cord of the deck into a wall outlet or set the timer to continuous operation.
- If TIMER is left at REC, the deck will automatically start recording the next time you turn the deck on.
- If you do not change the deck to standby status for more than two or three days after timer recording has finished, the recorded contents may disappear.

Make sure to change the deck to standby status within two or three days after timer recording is completed
The TOC on the MD is updated and recorded contents are written to the MD when you turn the deck on. If the recorded contents have disappeared, "STANDBY" flashes when you turn the deck on.

Notes
- During timer recording, new material is recorded from the end of the recorded portion on the MD.
- Material recorded during timer recording will be saved to the disc the next time you turn the deck on. "TOC" will flash in the display at that time. Do not move the deck or pull out the AC power cord while "TOC" is flashing.
- Timer recording will stop if the disc becomes full.

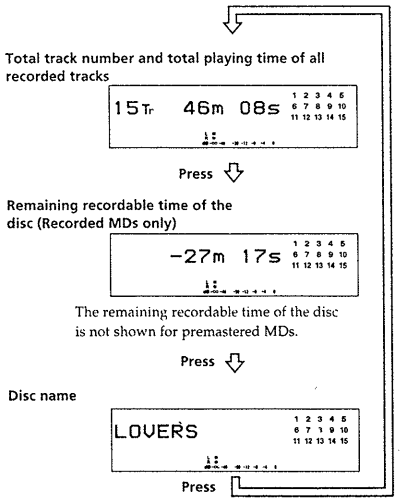
Using the Display

You can use the display to check disc and track information such as the total track number, total playing time of the tracks, remaining recordable time of the disc, disc name, and recording date and time of the current track.

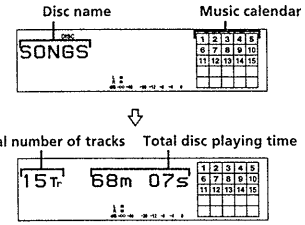


Checking the total track number, total disc playing time, remaining recordable time of the disc and the title of the disc

Each time you press DISPLAY while the deck is stopped, you can change the display as follows:


Total track number and total playing time of all recorded tracks
15Tr 46m 08s
Press
Remaining recordable time of the disc (Recorded MDs only)
-27m 17s
The remaining recordable time of the disc is not shown for premastered MDs.
Press
Disc name
LOVERS
Press

When you insert an MD, the disc name, total number of tracks, and total disc playing time appear in the display as follows:

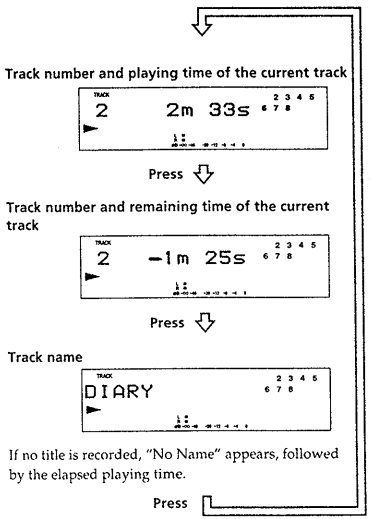


The disc name appears, followed by the total number of tracks (Tr) and total disc playing time.
A music calendar showing all the track numbers appears within a grid if the MD is a premastered disc, or without a grid if the MD is a recordable disc.
If the total track number exceeds 25, ► appears to the right of number 25 in the music calendar.
To label a recordable disc and its tracks, see "Labeling Recordings" on page 29.

Note
When you insert a new MD or turn off the deck and turn it on again, the last item displayed will reappear.
If, however, you disconnect the AC power cord, the display will show the total track number and total playing time of all recorded tracks the next time you turn on the deck, no matter what the last display was.

Checking remaining time and the title of a track

Each time you press DISPLAY while playing an MD, you can change the display as shown below. The track numbers in the music calendar disappear after they are played.



If no title is recorded, "No Name" appears, followed by the elapsed playing time.

You can check the track name at any time while playing an MD

Press SCROLL.

Since the display shows up to 12 characters at a time, press SCROLL again to see the rest of the track title if the title has 13 characters or more.

Press SCROLL again to pause scrolling, and again to continue scrolling.

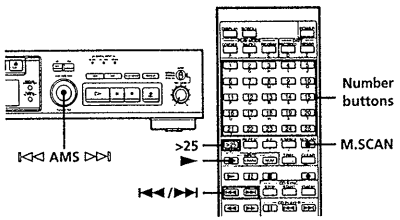
Note

When you insert a new MD or turn off the deck and turn it on again, the last item displayed will reappear.

If, however, you disconnect the AC power cord, the display will show the total track number and total playing time of all recorded tracks the next time you turn on the deck, no matter what the last display was.

Locating a Specific Track

You can quickly locate any track while playing a disc by using AMS (Automatic Music Sensor), I◄◄ and ►►I, number buttons or M.SCAN on the remote.



To locate	Do the following:
The next or succeeding tracks	During playback, turn AMS clockwise or press ►►I repeatedly until you find the track.
The current or preceding tracks	During playback, turn AMS counterclockwise or press I◄◄ repeatedly until you find the track.
A specific track directly	Press number buttons to enter the track number.
By scanning each track for 6 seconds (music scan)	1 Press M.SCAN before you start playing. 2 When you find the track you want, press ► to start playing.

When you directly locate a track with a number over 25

You must press >25 first, before entering the corresponding digits.

Press >25 once if it is a 2-digit track number, and twice if it is a 3-digit track number.

To enter "0," press button 10.

Examples:
- To play track number 30
  Press >25 once, then 3 and 10.
- To play track number 100
  Press >25 twice, then 1, 10 and 10.

You can extend the playing time during music scan

While the deck is stopped, press M.SCAN repeatedly until the playing time you want (6, 10 or 20 seconds) appears in the display. Each press changes the time in order of 6 to 20, then from 6 again.

To pause playing at the beginning of a track

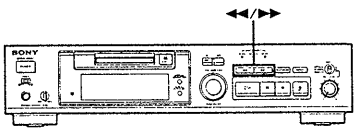
Turn AMS (or press I◄◄ or ►►I) after pausing playback.

To go quickly to the beginning of the last track

Turn AMS counterclockwise (or press I◄◄) while the display shows the total track number and total disc playing time, remaining recordable time of the disc, or disc name (see page 18).

Locating a Particular Point in a Track

You can also use ◄◄ and ►► to locate a particular point in a track during playback or playback pause.



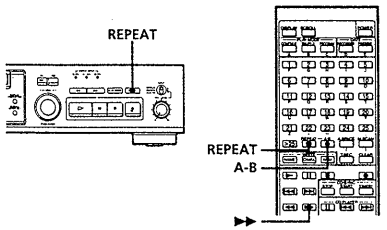
To locate a point	Press
While monitoring the sound	►► (forward) or ◄◄ (backward) and keep pressing until you find the point
Quickly by observing the display during playback pause	►► or ◄◄ and keep pressing until you find the point. There is no sound output during this operation.

Notes

- If the disc reaches the end while you are pressing ►► during playback pause, "OVER" appears in the display. Press ◄◄ (or I◄◄) or turn AMS counterclockwise to go back.
- If the disc reaches the end while you are pressing ►► during sound monitoring, the deck stops.
- Tracks that are only a few seconds long may be too short to scan using the search function. For such tracks, it is better to play the MD at normal speed.

Playing Tracks Repeatedly

You can play tracks repeatedly in any play mode.



Press REPEAT.
"REPEAT" appears in the display. The deck repeats the tracks as follows:

When the MD is played in	The deck repeats
Normal play (page 10)	All the tracks
Shuffle Play (page 22)	All the tracks in random order
Program Play (page 22)	The same program

To cancel repeat play
Press REPEAT several times until "REPEAT" disappears.
The deck returns to the original playing mode.

Repeating the current track

While the track you want to repeat is playing in normal play, press REPEAT several times until "REPEAT 1" appears in the display.

Repeating a specific portion (A-B Repeat)

You can play a specific portion of a track repeatedly. This might be useful when you want to memorize lyrics.
Note that you can only repeat a portion within the boundaries of a single track.

1 While playing a disc, press A-B at the starting point (point A) of the portion to be played repeatedly.
"REPEAT A-" flashes in the display.

2 Continue playing the track or press ▶▶ until you reach the ending point (point B), then press A-B again.
"REPEAT A-B" lights continuously. The deck starts to play the specified portion repeatedly.

To cancel A-B Repeat
Press REPEAT.

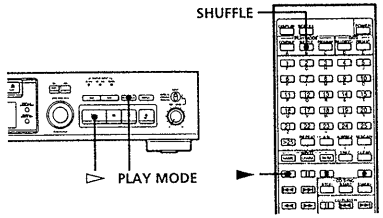
Setting new starting and ending points
You can repeat the portion immediately after the currently specified portion by changing the starting and ending points.
1 Press A-B while "REPEAT A-B" appears.
The current ending point B becomes the new starting point A and "REPEAT A-" flashes in the display.
2 Continue playing the track or press ▶▶ until you reach the new ending point (point B), then press A-B again.
"REPEAT A-B" lights continuously and the deck starts playing repeatedly the newly specified portion.

Note
If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting of the Repeat Function the next time you turn on the deck.
The A-B Repeat settings, however, are lost.

Playing MDs

Playing in Random Order (Shuffle Play)

You can have the deck "shuffle" tracks and play them in random order.



1 Press PLAY MODE repeatedly (or SHUFFLE once) until "SHUFFLE" appears in the display when the deck is stopped.

2 Press ▷ to start Shuffle Play.
"🔀" appears in the display while the deck is "shuffling" the tracks.

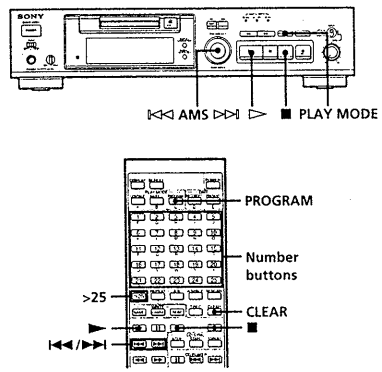
To cancel Shuffle Play
Press PLAY MODE repeatedly (or CONTINUE once) until "SHUFFLE" disappears.

You can specify tracks during Shuffle Play
- To play the next track, turn AMS clockwise (or press ▶▶|).
- To play from the beginning of the current track again, turn AMS counterclockwise (or press |◀◀). You cannot use AMS (or |◀◀) to go to tracks that have already been played.

Note
If you turn off the deck or disconnect the AC power cord while the Shuffle Play Function is selected, the Shuffle Play Function will be still selected the next time you turn on the deck.

Creating Your Own Program (Program Play)

You can specify the playback order of the tracks on an MD and create your own programs containing up to 25 tracks.



1 Press PLAY MODE repeatedly (or PROGRAM once) until "PROGRAM" appears in the display when the deck is stopped.

2 Do either a) or b):
a) When using the remote
Press the number buttons to enter the tracks you want to program in the order you want.
To program a track with a number over 25, use the >25 button (see page 20).

If you've made a mistake
Press CLEAR, then press the right number button.

b) When using the controls on the deck
1 Turn AMS until the track number you want appears in the display.
2 Press AMS or PLAY MODE.

3 Repeat Step 2 to enter other tracks. Each time you enter a track, the total program time is added up and appears in the display.

4 Press ▷ to start Program Play.

To cancel Program Play
Press PLAY MODE repeatedly (or CONTINUE once) when the deck is stopped until "PROGRAM" disappears.

Note
The program created by the Program Play Function is lost when you turn off the deck or disconnect the AC power cord. The program is, however, recalled during timer playback.

You can program the same track repeatedly
While the track number appears in the display, press AMS as many times as you want.

The program remains even after Program Play ends
When you press ▷, you can play the same program again.

Note
The display shows "- -m - -s" instead of the total playing time of the program exceeds 100 minutes.

Checking the track order

You can check the order of tracks in your program during playback or playback pause.

Turn AMS (or press ⏮ or ⏭) during playback or playback pause. The track numbers appear in the order they were programmed.

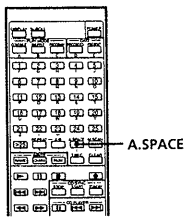
Changing the track order

You can change the order of the tracks in your program before you start playing.

To	Do the following:
Erase the last track in the program	Press CLEAR. Each time you press the button, the last track will be cleared.
Add tracks to the end of the program	Do Steps 2 and 3 in "Creating Your Own Program."
Change the whole program completely	1 Press ■ while the deck is stopped. 2 Do Steps 2 and 3 in "Creating Your Own Program."

Useful Tips When Recording From MDs to Tape

The Auto Space and Auto Pause Functions described in this section make recording from MDs to tape more easy.



Inserting blank spaces while recording to tape (Auto Space)

The Auto Space Function inserts a 3-second blank space between each track while recording from MDs to tapes, allowing you to use the AMS function during later playback.

Press A.SPACE repeatedly until "A.SPACE" appears in the display.

To cancel Auto Space
Press A.SPACE repeatedly until "A.SPACE" disappears.

Note
If the Auto Space Function is on while recording a selection containing multiple track numbers, (for example, a medley or symphony), blank spaces will be inserted within the selection whenever the track number changes.

Pausing after each track (Auto Pause)

When the Auto Pause Function is on, the deck pauses after playing each track. Auto Pause is convenient when recording single tracks or multiple, non-consecutive tracks.

Press A.SPACE repeatedly until "A.PAUSE" appears in the display.

To restart playback
Press ▷ or ⏸.

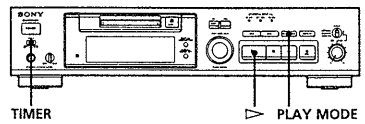
To cancel Auto Pause
Press A.SPACE repeatedly until "A.PAUSE" disappears.

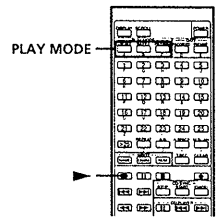
Note
If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting of the Auto Space and Auto Pause Functions the next time you turn on the deck.

Playing MDs

Playing an MD Using a Timer

By connecting a timer (not supplied) to the deck, you can start and stop playback operations at specified times. For further information on connecting the timer or setting the starting and ending times, refer to the instructions that came with the timer.





1 Do Steps 1 to 3 in "Playing an MD" on page 10.

2 Press PLAY MODE repeatedly (or one of the PLAY MODE buttons once) to select the play mode you want.
To play only specific tracks, create a program (see page 22).

3
- If you want to specify the time for the start of playback, go to Step 4.
- If you want to specify the time for the end of playback, press ▷ to start playback, then go to Step 4.
- If you want to specify the time for both start and end of playback, go to Step 4.

4 Set TIMER on the deck to PLAY.

5 Set the timer as required.
- When you have set the time for the start of playback, the deck turns off. When the specified time arrives, the deck turns on and starts playing.
- When you have set the time for the end of playback, playback continues. When the specified time arrives, the deck stops playing and turns off.
- When you have set the time for both the start and end of playback, the deck turns off. When the starting time arrives, the deck turns on and starts playing. When the ending time arrives, the deck stops playing and turns off.

6 After you have finished using the timer, set TIMER on the deck to OFF.

Note
You can select Program Play in Step 2. Note, however, that programs eventually fade away when the standby status is off, and therefore if you set the time too far in the future, the program may be gone when the specified time arrives. If this has occurred, the deck enters normal play mode at the specified time and the tracks play in consecutive order.

Notes on Editing

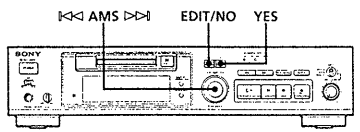
If "Protected" appears in the display
The deck could not erase the specified track because the record-protect slot on the MD is open. Erase the track after closing the slot.

When "TOC" flashes in the display
Do not move the deck or pull out the AC power cord. After editing, "TOC" lights continuously until you eject the MD or turn off the power. "TOC" flashes while the deck is updating the TOC. When the deck finishes updating the TOC, "TOC"goes off.

Erasing Recordings (Erase Function)

Do the procedures below to erase following:
- A single track
- All tracks
- Parts of a track

Note, however, that once erased, MD data cannot be recovered.

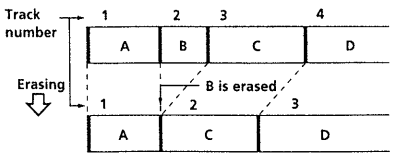


Erasing a single track

You can erase a track simply by specifying the respective track number. When you erase a track, the total number of tracks on the MD decreases by one and all tracks following the erased one are renumbered. Since erasing merely updates the TOC, there is no need to record over material.

To avoid confusion when erasing multiple tracks, you should proceed in order of high to low track number to prevent the renumbering of tracks that have not been erased yet.

Example: Erasing B



1 Turn AMS until the track number you want to erase appears in the display.

2 Press EDIT/NO repeatedly until "Erase ?" appears in the display.
The track number you selected starts flashing in the music calendar.

3 Press YES.
When the track selected in Step 1 has been erased, "Complete" appears for a few seconds and the total number of tracks in the music calendar decreases by one.
If you erase a track during playback, the track following the deleted track begins playing afterwards.

4 Repeat Steps 1 to 3 to erase more tracks.

To cancel the Erase Function
Press EDIT/NO, ■, or turn AMS to change the track number.

Note
If "Erase!! ?"appears in the display, the track was recorded or edited on another MD deck and is record-protected. If this indication appears, press YES to erase the track.

Erasing all tracks on an MD

Erasing a recordable MD deletes the disc name, all recorded tracks, and titles (see page 30).

1 While the deck is stopped, press EDIT/NO repeatedly until "All Erase ?" appears in the display.

2 Press YES.
All tracks in the music calendar start flashing.

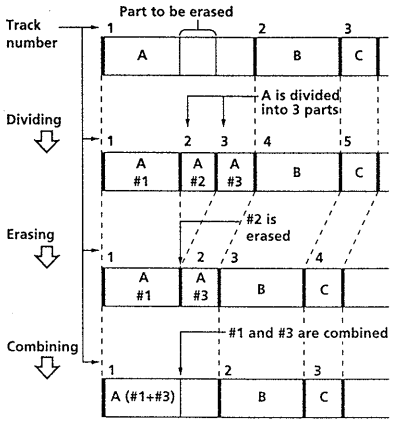
3 Press YES again.
When the disc name, all recorded tracks, and titles on the MD have been erased, "Complete" appears for a few seconds and the music calendar disappears.

To cancel the Erase Function
Press EDIT/NO or ■.

Erasing a part of a track

By using the Divide (see this page), Erase (see page 25) and Combine (see page 27) Functions, you can erase specific portions of a track.

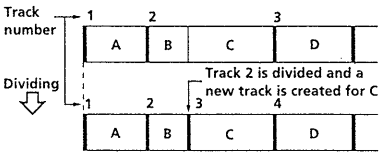
Example: Erasing a part of track A

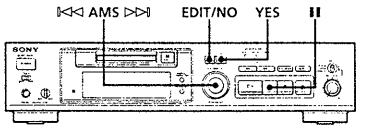


Dividing Recorded Tracks (Divide Function)

With the Divide Function you can assign a track number at places that you want to randomly access afterwards. Use this function to add tracks to MDs recorded from an analog source (and therefore contain no track numbers), or to divide an existing track into multiple portions. When you divide a track, the total number of tracks on the MD increases by one and all tracks following the divided track are renumbered.

Example: Dividing track 2 to create a new track for C



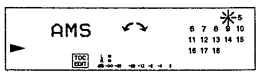


1 While playing the MD, press ❚❚ at the point where you want to create a new track.
The deck pauses playing.

2 Press EDIT/NO repeatedly until "Divide ?" appears in the display.

3 Press YES to divide the track.
"Rehearsal" alternates with "Position ok?" in the display, the track to be divided starts flashing in the music calendar, and the starting portion of the new track begins playing repeatedly.

4 If the starting position is incorrect, press EDIT/NO. (If it is correct, go to Step 7.)



5 While monitoring the sound, turn AMS to find the starting position of the new track.
The starting portion of the new track is played back repeatedly.
"Rehearsal" alternates with "Position ok?" in the display.
The starting position can be moved within a maximum range of –128 to +127 steps of about 0.06 second each within a track.

6 If the starting position is still incorrect, repeat Step 5 until it is correct.

7 Press YES or AMS when the position is correct.
When the track has been divided, "Complete" appears for a few seconds and the newly created track begins playing. The new track will have no track title even if the original track was labeled.

To cancel the Divide Function
Press ■.

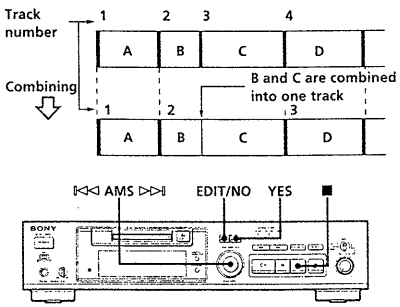
You can undo a track division
Combine the tracks again (see "Combining Recorded Tracks" on this page) then redivide the tracks if necessary.

You can divide a track while recording
Use the Track Marking Function (see page 14).

Combining Recorded Tracks (Combine Function)

Use the Combine Function while the deck is stopped, playing or in pause to combine consecutive tracks on a recorded MD. This function is useful for combining several songs into a single medley, or several independently recorded portions into a single track. When you combine two tracks, the total number of tracks decreases by one and all tracks following the combined tracks are renumbered.

Example: Combining B and C



1 Turn AMS until the second track of the two to be combined appears.
For example, when combining tracks 3 and 4, turn AMS until 4 appears.

2 Press EDIT/NO repeatedly until "Combine ?" appears in the display.

3 Press YES.
"Rehearsal" alternates with "Track ok?" in the display. The place where the two tracks will join (i.e., the end of the first track and the beginning of the second track) repeatedly plays back and the respective track number flashes in the music calendar.

4 If the track is the wrong one, press EDIT/NO or ■, then start from Step 1 again.

5 If the place is correct, press YES.
When the tracks have been combined, "Complete" appears for a few seconds and the total number of tracks in the music calendar decreases by one.
If both of the combined tracks have track titles, the title of the second track is erased.

To cancel the Combine Function
Press EDIT/NO or ■.

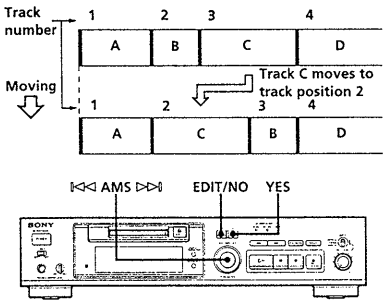
You can undo a track combination
Divide the tracks again (see "Dividing Recorded Tracks" on page 26), then repeat the combine function with the correct tracks if necessary.

Note
If "Sorry" appears in the display, the tracks cannot be combined. This sometimes happens when you've edited the same track many times, and is due to a technical limitation of the MD system, not a mechanical error.

Moving Recorded Tracks (Move Function)

Use the Move Function to change the order of any track. After you move a track, the track numbers between the new and old track positions are automatically renumbered.

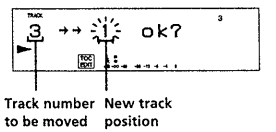
Example: Moving track C to track position 2



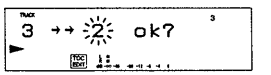
1 Turn AMS until the track number you want to move appears in the display.

2 Press EDIT/NO repeatedly until "Move ?" appears in the display.

3 Press YES.
The track number to be moved and the new track position appears.



4 Turn AMS until the new track position appears.

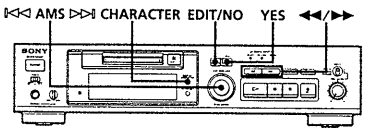


5 Press YES or AMS.
After you have moved the track, "Complete" appears for a few seconds and the moved track begins playing back if the deck is in playback mode.

To cancel the Move Function
Press EDIT/NO or ■.

Labeling Recordings (Title Function)

You can create titles for your recorded MDs and tracks. Titles — which may consist of uppercase and lowercase letters, numbers and symbols for a maximum of about 1,700 characters per disc — appear in the display during MD operation.



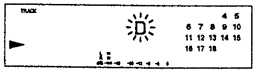
Use the following procedure to label a track or an MD.
You can label a track while it is playing, pausing or recording. If the track is playing, be sure to finish labeling before the track ends. If the track ends before you've completed the labeling procedure, the characters already entered are not recorded and the track will remain unlabeled.

1 Press EDIT/NO repeatedly until "Name in ?" appears in the display, then do the following:

To label	Make sure that the deck is
A track	Playing, pausing, recording the track to be labeled, or stopped after locating the track to be labeled
An MD	Stopped with no track number appearing in the display

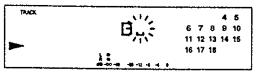
2 Press YES.
A flashing cursor appears in the display.

3 Turn AMS to select the character.



The selected character flashes.
Letters, numbers, and symbols appear in sequential order as you turn AMS.
You can use the following symbols in titles:
! " # $ % & ' ( ) * + , - . / : ; < = > ? @ _ `

4 Press AMS to enter the selected character.
The cursor shifts rightward and waits for the input of the next character.



5 Repeat Steps 3 to 5 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing, and repeat Steps 3 to 5 to enter the correct character.

To erase a character
Press ◀◀ or ▶▶ until the character to be erased starts flashing, then press EDIT/NO.

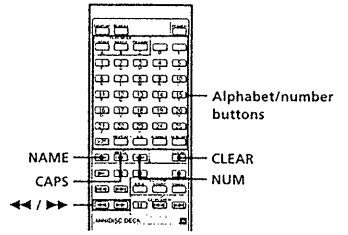
To enter a space
Press AMS or ▶▶ while the cursor is flashing.

6 Press YES.
This completes the labeling procedure and the title appears on the left side of the display.

To cancel labeling
Press ■.

Note
You cannot label a track or an MD while you are recording over an existing track.

Labeling tracks and MDs with the remote



1 Press NAME repeatedly until a flashing cursor appears in the display, then do the following:

To label	Make sure that the deck is
A track	Playing, pausing, recording the track to be labeled, or stopped after locating the track to be labeled
An MD	Stopped with no track number appearing in the display

2 Select the character type as follows:

To select	Press
Uppercase letters	CAPS repeatedly until "Selected ABC" appears in the display
Lowercase letters	CAPS repeatedly until "Selected abc" appears in the display
Numbers	NUM repeatedly until "Selected 123" appears in the display

3 Enter one character at a time.
After you enter a character, the cursor shifts rightward and waits for the input of the next character.

4 Repeat Steps 2 and 3 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing.
Press CLEAR to erase the incorrect character, then enter the correct one.

5 Press NAME again.
The entered title appears on the left side of the display window after the label has been recorded.

To cancel labeling
Press ■.

Changing an existing title

1 Press NAME, then do the following:

To change	Make sure that the deck is
A track title	Playing, pausing the track whose title is to be changed, or stopped after locating the track whose title is to be changed
A disc name	Stopped with no track number appearing in the display

2 Keep pressing CLEAR (or EDIT/NO on the deck) until the current title is erased.

3 Enter the new title.
Do Steps 3 to 5 of "Labeling Recordings" on page 29, or Steps 2 to 4 of "Labeling tracks and MDs with the remote" on this page.

4 Press NAME.

Erasing all titles on a disc (Name Erase Function)

Use this function to erase all titles on an MD simultaneously.
Note that once erased, titles cannot be recovered.

1 Keep pressing EDIT/NO while the deck is stopped until "All Erase ?" appears in the display.

2 Press EDIT/NO again.
"Name Erase ?" appears in the display.

3 Press YES.
All titles are erased.

To cancel the Name Erase Function
Press ■.

You can erase all recorded tracks and titles
See "Erasing all tracks on an MD" on page 25.

Display Messages

The following table explains the various messages that appear in the display.

Message	Meaning
Blank Disc	A new (blank) or erased MD has been inserted.
Cannot Copy	An attempt was made to make a second copy from a digitally dubbed MD (see page 34).
Cannot EDIT	An attempt was made to edit the MD during Program or Shuffle Play.
Disc Error	The MD is scratched or missing a TOC.
Disc Full	The MD is full (see "System Limitations" on page 32).
Impossible	An attempt was made to combine tracks while playing back the first track.
Name Full	The titling capacity of the MD has reached its limit (about 1,792 characters).
NO DISC	There is no MD in the deck.
No Track	The inserted MD has a disc title but no tracks.
Protected	The inserted MD is record-protected.
Retry	The first recording attempt failed due to a disturbance or scratch on the MD, and a second attempt is being made.
Retry Error	Due to vibrations to the deck or scratches on the MD, several recording attempts were made but with no success.
Sorry	An attempt was made to combine tracks that cannot be combined.
STANDBY (flashing)	The contents recorded by timer have disappeared over time and are not be available for saving to disc, or Program Play could not be activated since the program has disappeared over time.

System Limitations

The recording system in your MiniDisc deck is radically different from those used in cassette and DAT decks and is characterized by the limitations described below. Note, however, that these limitations are due to the inherent nature of the MD recording system itself and not to mechanical causes.

"Disc Full" lights up even before the MD has reached the maximum recording time (60 or 74 minutes)
When 255 tracks have been recorded on the MD, "Disc Full" lights up regardless of the total recorded time. More than 255 tracks cannot be recorded on the MD. To continue recording, erase unnecessary tracks or use another recordable MD.

"Disc Full" lights up before the maximum number of tracks is reached
Fluctuations in emphasis within tracks are sometimes interpreted as track intervals, incrementing the track count and causing "Disc Full" to light up.

The remaining recording time does not increase even after erasing numerous short tracks
Tracks under 12 seconds in length are not counted and so erasing them may not lead to an increase in the recording time.

Some tracks cannot be combined with others
Track combination may become impossible when tracks are edited.

The total recorded time and the remaining time on the MD may not total the maximum recording time (60 or 74 minutes)
Recording is done in minimum units of 2 seconds each, no matter how short the material. The contents recorded may thus be shorter than the maximum recording capacity. Disc space may also be further reduced by scratches.

Tracks created through editing may exhibit sound dropout during search operations.

Track numbers are not recorded correctly
Incorrect assignment or recording of track numbers may result (1) when CD tracks are divided into several smaller tracks during digital recording, or (2) while recording certain CDs with the "LEVEL SYNC" indication on (i.e., the automatic track marking function on).

"TOC Reading" appears for a long time
If the inserted recordable MD is brand new, "TOC Reading" appears in the display longer than for MDs that have been used.

Limitations when recording over an existing track
- The correct remaining recording time may not be displayed.
- You may find it impossible to record over a track if that track has been recorded over several times already. If this happens, erase the track using the Erase Function (see page 25).
- The remaining recording time may be shortened out of proportion to the total recorded time.
- Recording over a track to eliminate noise is not recommended since this may shorten the duration of the track.
- You may find it impossible to label a track while recording over it.

The correct recorded/playing time may not be displayed during playback of monaural-format MDs.

Troubleshooting

If you experience any of the following difficulties while using the deck, use this troubleshooting guide to help you remedy the problem. Should any problem persist, consult your nearest Sony dealer.

The deck does not operate or operates poorly.
- ➡The MD may be damaged ("Disc Error" appears). Take the MD out and insert it again. If "Disc Error" remains, replace the MD.

The deck does not play back.
- ➡Moisture has formed inside the deck. Take the MD out and leave the deck in a warm place for several hours until the moisture evaporates.
- ➡The deck is not on. Press POWER to turn the deck on.
- ➡The MD is inserted in the wrong direction. Slide the MD into the disc compartment with the label side up and the arrow pointing towards the opening until the deck grips it.
- ➡The MD may not be recorded (the music calendar does not appear). Replace the disc with one that has been recorded.

The deck does not record.
- ➡The MD is record-protected ("Protected" appears). Close the record-protect slot (see page 9).
- ➡The deck is not connected properly to the sound source. Make connections properly to the sound source.
- ➡The recording level is not adjusted properly (in case of input through LINE (ANALOG) IN). Turn REC LEVEL to adjust the recording level properly (see page 13).
- ➡A premastered MD is inserted. Replace it with a recordable MD.
- ➡There is not enough time left on the MD. Replace it with another recordable MD with fewer recorded tracks, or erase unnecessary tracks.
- ➡There has been a power failure or the AC power cord has been disconnected during recording. Data recorded to that point may be lost. Repeat the recording procedure.

The deck does not work during synchro-recoding.

➡The currently selected CD player type (CD player or video CD player) does not match the CD player being used. Reset the CD player type (see page 16).

An incompletely inserted MD cannot be pulled out.

➡When the MD is inserted half-way, the mechanism locks onto the MD and the ⏏ EJECT button will not operate. To remove the MD, first insert the MD completely, then press the ⏏ EJECT button.

The sound has a lot of static.

➡Strong magnetism from a television or a similar device is interfering with operations. Move the deck away from the source of strong magnetism.

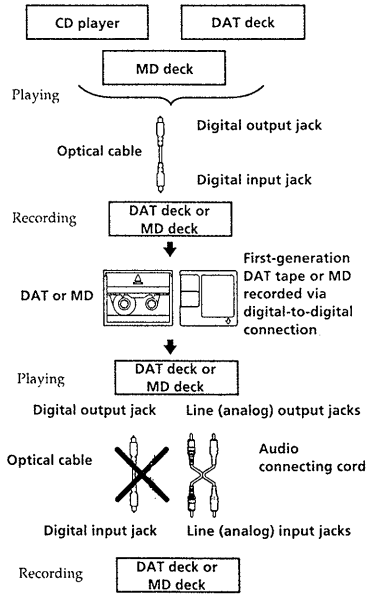
Note

If the deck does not operate properly even after you've attempted the prescribed remedies, turn off the power, then reinsert the plug into the power outlet.

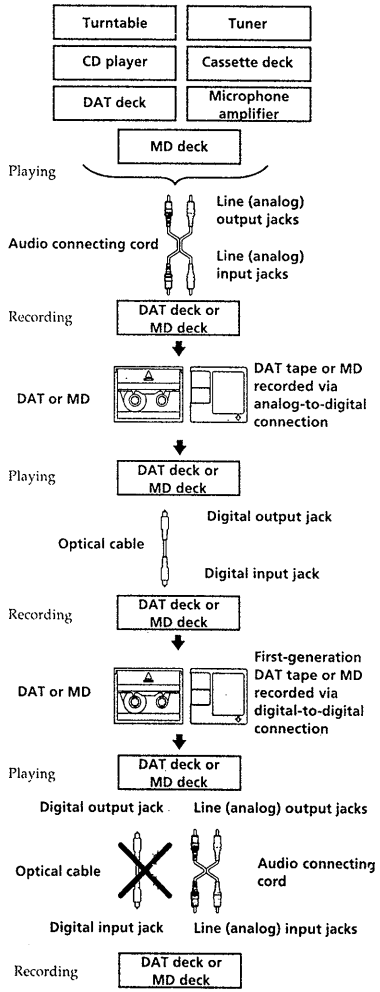
Guide to the Serial Copy Management System

This MD deck uses the Serial Copy Management System, which allows only first-generation digital copies to be made of premastered software via the deck's digital input jack. An outline of this system appears below:

1 You can record from digital program sources (CDs, DATs or premastered MDs) onto a DAT tape or recordable MD via digital input jack on the DAT or MD deck. You cannot, however, record from this recorded DAT tape or MD onto another DAT tape or recordable MD via the digital input jack on the DAT or MD deck.



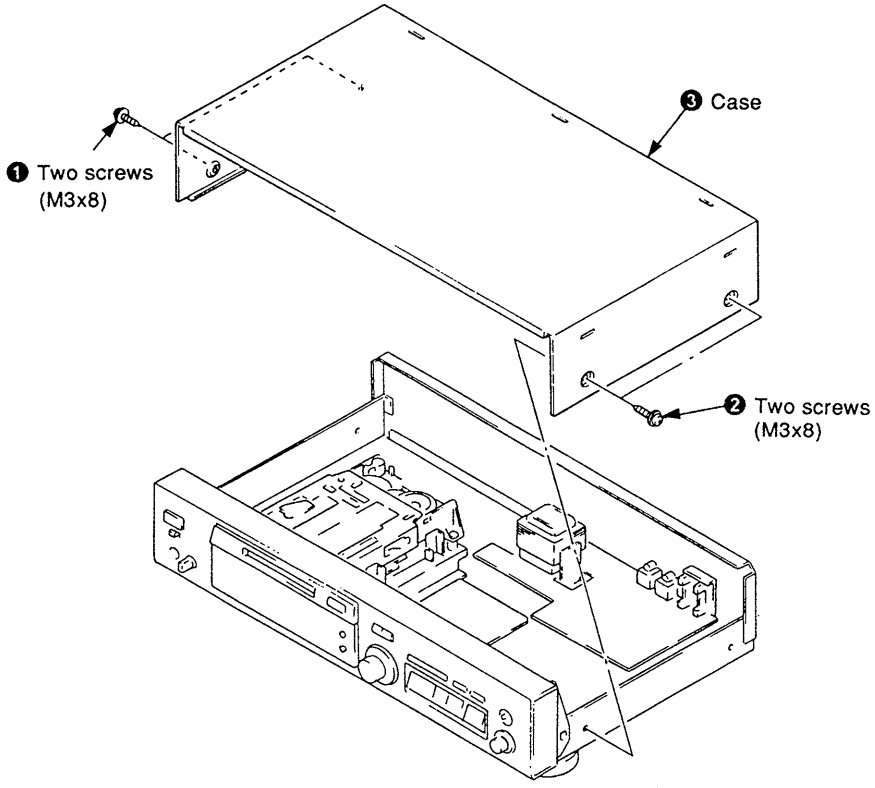
3 You can record a DAT tape or MD recorded via the DAT or MD deck's analog input jack onto another DAT tape or MD via the DAT or MD deck's digital output jack. You cannot, however, make a second-generation DAT tape or MD copy via the DAT or MD deck's digital output jack.



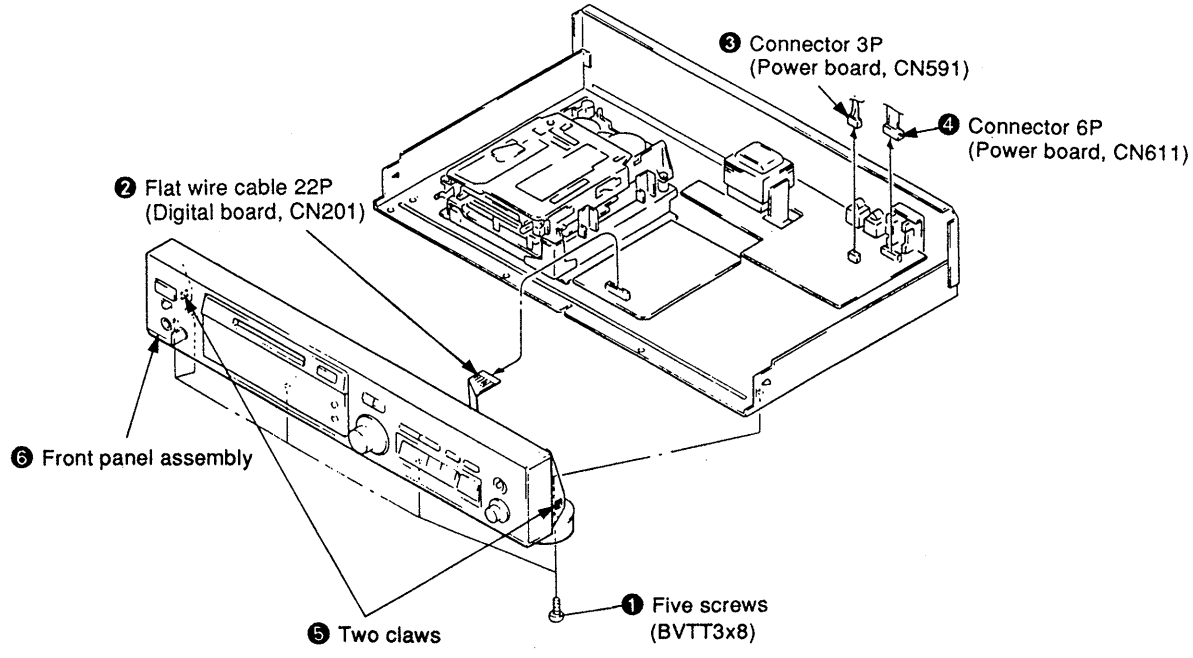
SECTION 2
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

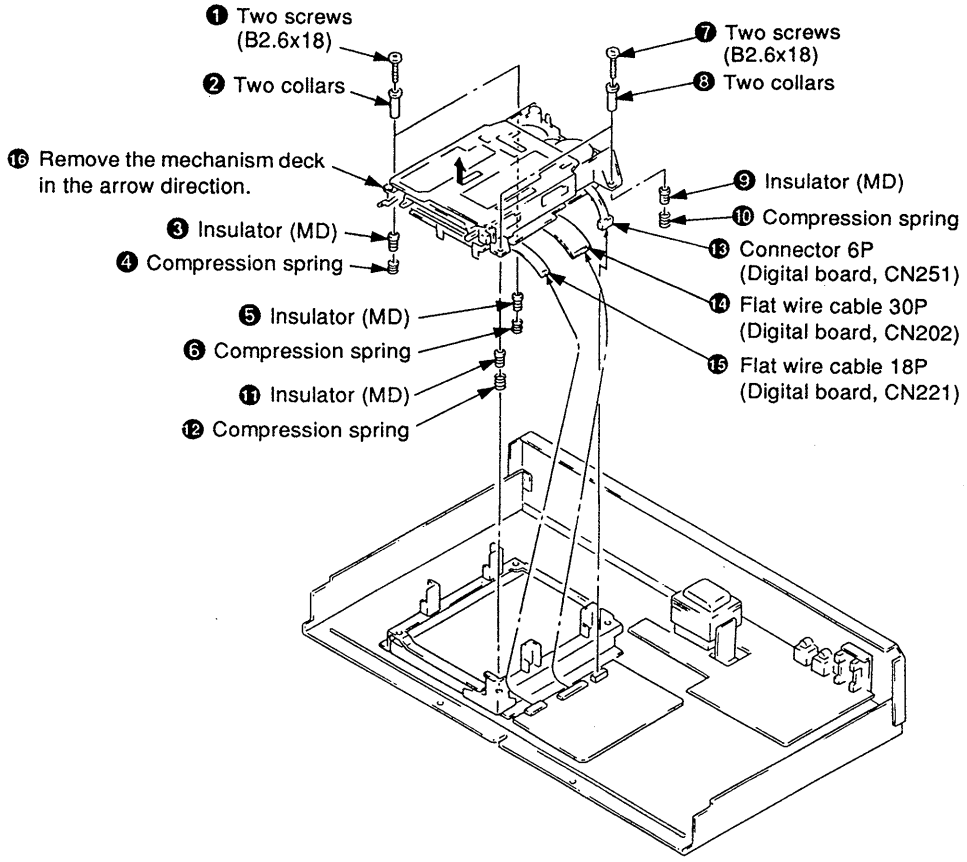
2-1. CASE



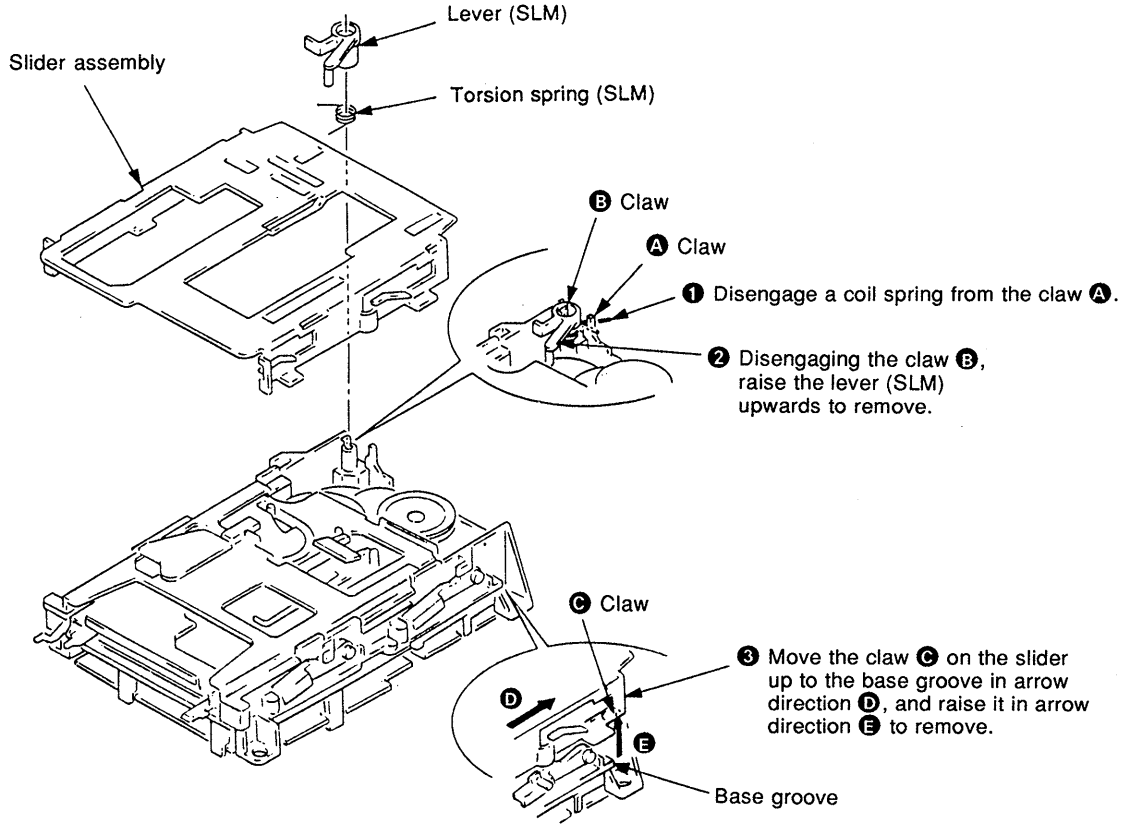
2-2. FRONT PANEL ASSEMBLY



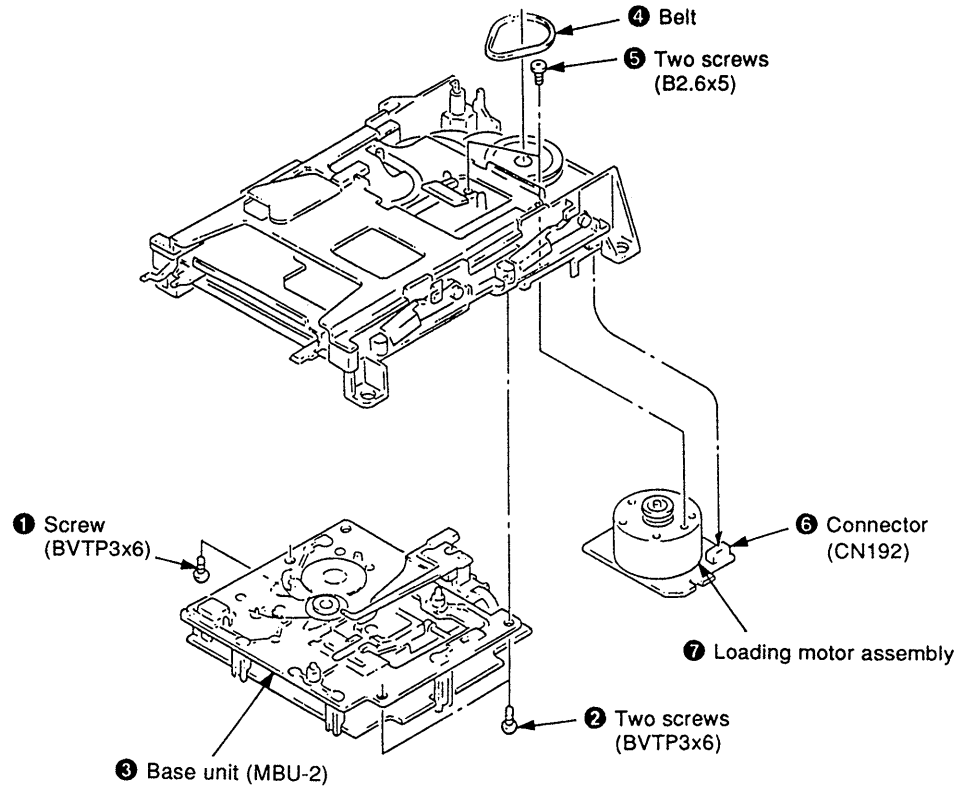
2-3. MECHANISM DECK


❶ Two screws (B2.6x18)
❷ Two collars
❸ Insulator (MD)
❹ Compression spring
❺ Insulator (MD)
❻ Compression spring
❼ Two screws (B2.6x18)
❽ Two collars
❾ Insulator (MD)
❿ Compression spring
⓫ Insulator (MD)
⓬ Compression spring
⓭ Connector 6P (Digital board, CN251)
⓮ Flat wire cable 30P (Digital board, CN202)
⓯ Flat wire cable 18P (Digital board, CN221)
⓰ Remove the mechanism deck in the arrow direction.

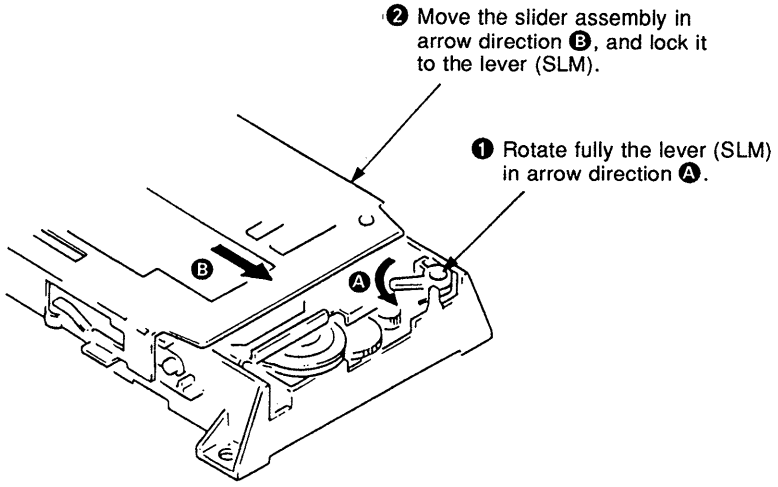
2-4. SLIDER ASSEMBLY


Lever (SLM)
Slider assembly
Torsion spring (SLM)
Ⓑ Claw
Ⓐ Claw
❶ Disengage a coil spring from the claw Ⓐ.
❷ Disengaging the claw Ⓑ, raise the lever (SLM) upwards to remove.
Ⓒ Claw
❸ Move the claw Ⓒ on the slider up to the base groove in arrow direction Ⓓ, and raise it in arrow direction Ⓔ to remove.
Ⓓ
Ⓔ
Base groove

2-5. BASE UNIT AND LOADING MOTOR ASSEMBLY



2-6. SLIDER ASSEMBLY MOUNTING



SECTION 3
TEST MODE

3-1. Setting the Test Mode

While pressing the AMS knob, insert the power plug into the power supply inlet, and release the AMS knob.

3-2. Exiting the Test Mode

Disconnect the power plug from the power supply inlet.

3-3. Basic Operations of the Test Mode

All operations are performed using the AMS knob, YES key, and NO key.
The functions of these keys are as follows.

Function	Contents
AMS knob	Changes parameters and modes
YES key	Proceeds onto the next step. Finalizes input.
NO key	Returns to previous step. Stops operations.

3-4. Selecting the Test Mode

Eight test modes are selected by turning the AMS knob.

Display	Contents
TEMP ADJUST	Temperature compensation offset adjustment
LDPWR ADJUST	Laser power adjustment
EFBAL ADJUST	Traverse adjustment
FBIAS ADJUST	Focus bias adjustment
FBIAS CHECK	Focus bias check
CPLAY MODE	Continuous playback mode
CREC MODE	Continuous recording mode
EEP MODE	Non-volatile memory mode *

For detailed description of each adjustment mode, refer to 4. Electrical Adjustments.
If a different adjustment mode has been selected by mistake, press the NO key to exit from it.
* The EEP MODE is not used in servicing. If set accidentally, press the NO key immediately to exit it.

3-4-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
   ① Set the disc in the unit (either MO or CD).
   ② Rotate the AMS knob and display "CPLAY MODE".
   ③ Press the YES key to change the display to "CPLAYIN".
   ④ When access completes, the display changes to "C1 = ▯▯▯▯ AD = ▯▯".
   Note : The "▯" displayed are arbitrary numbers.
2. Changing the parts to be played back
   ① Press the YES key during continuous playback to change the display to "CPLY MID", "CPLAY OUT". When pressed another time, the parts to be played back can be changed.
   ② When access completes, the display changes to "C1 = ▯▯▯▯ AD = ▯▯".
   Note : The "▯" displayed are arbitrary numbers.
3. Ending the continuous playback mode
   ① Press the NO key. The display will change to "CPLY MODE".
   ② Press the EJECT key and remove the disc.
   Note 1 : The playback start addresses for IN, MID, and OUT are as follows.
   IN 40h cluster
   MID 300h cluster
   OUT 700h cluster

3-4-2. Operating the Continuous Recording Mode

1. Entering the continuous recording mode
   ① Set the MO disc in the unit.
   ② Rotate the AMS knob and display "CREC MODE".
   ③ Press the YES key to change the display to "CREC IN".
   ④ When access completes, the display changes to "CREC (▯▯▯)" and **REC** lights up.
   Note : The "▯" displayed are arbitrary numbers.
2. Changing the parts to be recorded
   ① When the YES key is pressed during continuous recording, the display changes to "CREC MID", "CREC OUT" and **REC** goes off.
   When pressed another time, the parts to be recorded can be changed.
   ② When access completes, the display changes to "CREC (▯▯▯)" and **REC** lights up.
   Note : The "▯" displayed are arbitrary numbers.
3. Ending the continuous recording mode
   ① Press the NO key. The display changes to "CREC MODE" and **REC** goes off.
   ② Press the EJECT key and remove the disc.
   Note 1 : The recording start addresses for IN, MID, and OUT are as follows.
   IN 40h cluster
   MID 300h cluster
   OUT 700h cluster
   Note 2 : The NO key can be used to stop recording anytime.
   Note 3 : During the test mode, the erasing-protection tab will not be detected. Therefore be careful not to set the continuous recording mode when a disc not to be erased is set in the unit.
   Note 4 : Do not perform continuous recording for long periods of time above 5 minutes.
   Note 5 : During continuous recording, be careful not to apply vibration.

3-4-3. Non-Volatile Memory Mode

This mode reads and writes the contents of the non-volatile memory.
It is not used in servicing. If set accidentally, press the NO key immediately to exit it.

3-5. Functions of Other keys

Function	Contents
▷/▯▯	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
■	Stops continuous playback and continuous recording.
▶▶	The sled moves to the outer circumference only when this is pressed.
◀◀	The sled moves to the inner circumference only when this is pressed.
●	Turns recording ON/OFF when pressed during continuous playback.
SCROLL	Switches between the pit and groove modes when pressed.
PLAY MODE	Switches the spindle servo mode (CLVS and A).
DISPLAY	Switches the display when pressed.Returns to previous step. Stops operations.

Note : The erasing-protection tab is not detected during the test mode. Recording will start regardless of the position of the erasing-protection tab when the ● (REC) key is pressed.

3-6. Test Mode Displays

Each time the DISPLAY key is pressed, the display changes in the following order.

MODE display→Error rate display→Address display

1. MODE display
   Displays "TEMP ADJUST", "CPLAY MODE", etc.
2. Address display
   Addresses are displayed as follows.
   h = [illegible] s = [illegible] (MO pit and CD)
   h = [illegible] a = [illegible] (MO groove)
   h = : Header address
   s = : SUBQ address
   a = : ADIP address
   * is displayed when the address cannot be read.
3. Error rate display
   Error rates are displayed as follows.
   C1 = [illegible] AD = [illegible]
   C1 = : Indicates C1 error
   AD= : Indicates ADER

3-7. Meanings of Other Displays

Display	Contents		
	Light	Off	Blinking
►	During continuous playback	STOP	
▯▯	Tracking servo OFF	Tracking servo ON	
REC	Recording mode ON	Recording mode OFF	
CLOCK	CLV LOCK	CLV UNLOCK	
TRACK	Pit	Groove	
DISC	High reflection	Low reflection	
DATE	CLV-S	CLV-A	
A. SPACE	ABCD adjustment completed		
A – B	(Focus auto gain successful / Tracking auto gain successful)		(Focus auto gain successful / Tracking auto gain failed)

3-8. Precautions for Use of Test Mode

① As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.
Even if the EJECT key is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
Therefore, it will be ejected while rotating.
Always press the NO key first before pressing the EJECT key.

② The erasing-protection tab is not detected in the test mode. Therefore, when modes which output the recording laser power such as continuous recording mode and traverse adjustment mode, etc. are set, the recorded contents will be erased regardless of the position of the tab. When using a disc that is not to be erased in the test mode, be careful not to enter the continuous recording mode and traverse adjustment mode.

③ Most keys can not be used while the error rate is displayed because of IC121 CXD2535AR bugs.

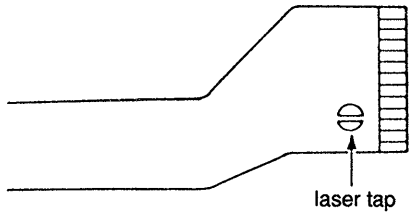
SECTION 4.
ELECTRICAL ADJUSTMENTS

4-1. Precautions for Checking Laser Diode Emission

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

4-2. Precautions for Use of optical pickup (KMS-210A)

As the laser diode in the optical pickup is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



Optical pickup flexible board

4-3. Precautions for Adjustments

1) When replacing the following parts, perform the adjustments and checks with O in the order shown in the following table.

	Optical Pickup	BD Board		
		IC171	D101	IC101, IC121, IC191
1. Temperature compensation offset adjustment	X	O	O	O
2. Laser power adjustment	O	X	X	O
3. Traverse adjustment	O	O	X	O
4. Focus bias adjustment	O	O	X	O
5. Error rate check	O	O	X	O

2) Set the test mode when performing adjustments. After completing the adjustments, exit the test mode.
3) Perform the adjustments in the order shown.
4) Use the following tools and measuring devices.
   - Test disc (CD) TDYS-1 (Parts No. 4-963-646-01)
   - Laser power meter LPM-8001 (Parts No. J-2501-046-A)
   - Oscilloscope
   - Digital voltmeter
   - Thermometer
5) When observing several signals on the oscilloscope, etc., make sure that VC and GND do not connect inside the oscilloscope. (VC and GND will become short-circuited.)
6) Do not move RV105 of the BD board. When replacing it, adjust to the mechanical center of the semi-fixed resistor.

4-4. Creating MO Continuously Recorded Disc

* This disc is used in focus bias adjustment and error rate check. The following describes how to create a MO continuous recording disc.

1. Insert a MO disc (blank disc) commercially available.
2. Rotate the AMS knob and display "CREC MODE".
3. Press the YES key and display "CREC IN".
4. Press the YES key again to display "CREC MID". "CREC (0300)" is displayed for a moment and recording starts.
5. Complete recording within 5 minutes.
6. Press the NO key and stop recording .
7. Press the EJECT key and remove the MO disc.

The above has been how to create a continuous recording data for the focus bias adjustment and error rate check.

Note :

- Be careful not to apply vibration during continuous recording.

4-5. Temperature Compensation Offset Adjustment

Save the temperature data at that time in the non-volatile memory as 25 °C reference data.

Note :

1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 °C to 28 °C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

Adjusting Method :

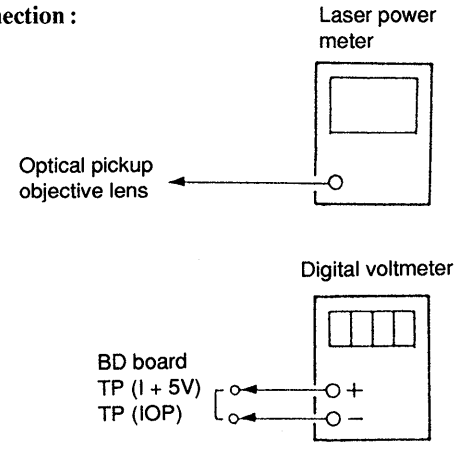
1. Rotate the AMS knob and display "TEMP ADJUST".
2. Press the YES key and select the "TEMP ADJUST" mode.
3. "TEMP = ▯▯" and the current temperature data will be displayed.
4. To save the data, press the YES key.
   When not saving the data, press the NO key.
5. When the YES key is pressed, "TEMP = ▯▯ SAVE" will be displayed for some time, followed by "TEMP ADJUST".
   When the NO key is pressed, "TEMP ADJUST" will be displayed.

Specifications :

The TEMP = ▯▯ should be within "TEMP = E0 – EF, F0 – FF" and "TEMP = 00 – 0F, 10 – 1F".

4-6. Laser Power Adjustment

Connection :



Adjusting Method :

1. Set the laser power meter on the objective lens of the optical pickup. (When it cannot be set properly, press the ◄◄ key or ►► key and move the optical pickup.)
   Connect the digital volt meter to TP (IOP) and TP (I+5V).
2. Rotate the AMS knob and display "LDPWRADJUST".
   (Laser power : For adjustment)
3. Press the YES key twice and display "LD $ 4B = 3.5 mW".
4. Adjust RV102 of the BD board so that the reading of the laser power meter becomes $3.4^{+0.1}_{-0}$ mW.
5. Press the YES key and display "LD $ 96 = 7.0 mW".
   (Laser power:MO reading)
6. Check that the laser power meter and digital voltmeter readings satisfy the specified value.

Specification :

Laser power meter reading : 7.0 ± 0.3 mW
Digital voltmeter reading : Optical pickup displayed value ± 10%

(Optical pickup label)

Iop = 82.5 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/ 1 (Ω)

7. Press the YES key and display "LD $ 0F = 0.7 mW".
   (Laser power:MO reading)
8. Check that the laser power meter at this time satisfies the specified value.

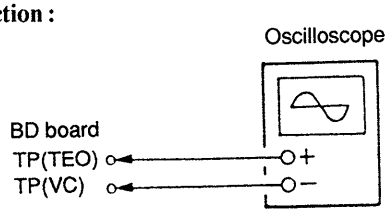
Specification :

Laser power meter reading : 0.70 ± 0.1 mW

9. Press the NO key and display "LDPWR ADJUST', and stop laser emission.
   (The NO key is effective at all times to stop the laser emission.)

4-7. Traverse Adjustment

Connection :



Adjusting method :

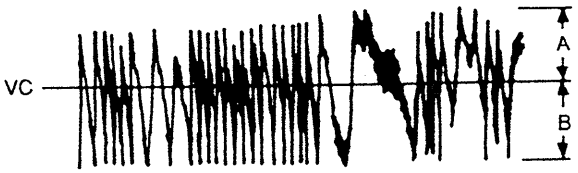
1. Connect an oscilloscope to TP (TEO) and TP (VC) of the BD board.
2. Load a MO disc (any available on the market).
3. Press the ◄◄ key or ►► key and move the optical pickup outside the pit.
4. Rotate the AMS knob and display "EFBAL ADJUST".
5. Press the YES key and display "EFBAL MO-W".
   (Laser power WRITE power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Adjust RV101 of the BD board so that the waveform of the oscilloscope becomes the specified value.
   (MO groove write power traverse adjustment)

(Traverse Waveform)

Specification A = B

7. Press the YES key and display "EFB = $ ▯ MO-R".
   (Laser power : MO reading)
8. Rotate the AMS knob so that the waveform of the oscilloscope becomes the specified value.
   (When the AMS knob is rotated, the ▯ of "EFB- ▯ " changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.
   (MO groove read power traverse adjustment)

(Traverse Waveform)



Specification A=B

9. Press the YES key, display "EFB = $ ▯ SAVE" for a moment and save the adjustment results in the non-volatile memory.
   Next "EFBAL MO-P" is displayed.
10. Press the YES key and display "EFB = $ ▯ MO-P".
    The optical pickup moves to the pit area automatically and servo is imposed.
11. Rotate the AMS knob until the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.

(Traverse Waveform)

Specification A=B

12. Press the YES key, display "EFB = ▯ SAVE" for a moment and save the adjustment results in the non-volatile memory.
    Next "EFBAL CD" is displayed. The disc stops rotating automatically.
13. Press the EJECT key and remove the MO disc.
14. Load the test disc TDYS-1.
15. Press the YES key and display "EFB = ▯ CD". Servo is imposed automatically.
16. Rotate the AMS knob so that the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.

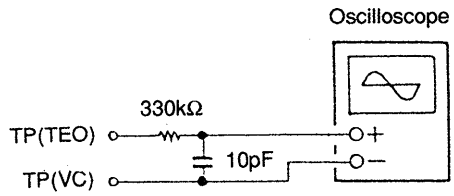
(Traverse Waveform)

Specification A=B

17. Press the YES key, display "EFB = $ ▯ SAVE" for a moment and save the adjustment results in the non-volatile memory.
    Next "EFBAL ADJUST" is displayed.
18. Press the EJECT key and remove the test disc TDYS-1.

Note 1) Data will be erased during MO reading if a recorded disc is used in this adjustment.

Note 2) If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



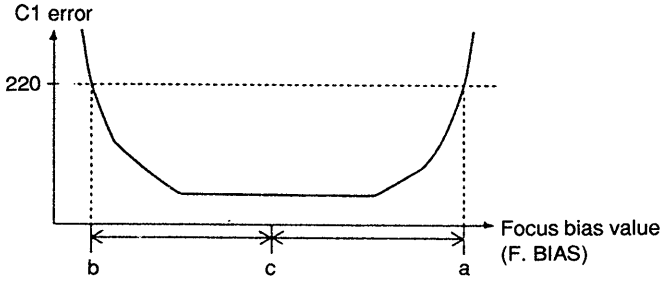
4-8. Focus Bias Adjustment

Adjusting Method :

1. Load a continuously recorded disc (Refer to "4-4. Creating MO Continuously Recorded Disc".).
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES key twice and display "CPLAY MID".
4. Press the NO key when "C1 = [illegible] AD = [illegible]" is displayed.
5. Rotate the AMS knob and display "FBIAS ADJUST".
6. Press the YES key and display " [illegible] a = [illegible]".
   The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [a =] indicate the focus bias value.
7. Rotate the AMS knob in the clockwise direction and find the focus bias value at which the C1 error rate becomes 220.
8. Press the YES key and display " [illegible] b = [illegible]".
9. Rotate the AMS knob in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes 220.
10. Press the YES key and display " [illegible] c = [illegible]".
11. Check that the C1 error rate is below 50 and ADER is 00. Then press the YES key.
12. If the "([illegible])" in "[illegible] - [illegible] - [illegible] ([illegible])" is above 20, press the YES key.
    If below 20, press the NO key and repeat the adjustment from step 2 again.
13. Press the NO key and press the EJECT key to remove the continuously recorded disc.

Note 1 : The relation between the C1 error and focus bias is as shown in the following figure. Find points a and b in the following figure using the above adjustment. The focal point position C is automatically calculated from points a and b.

Note 2 : As the C1 error rate changes, perform the adjustment using the average vale.



4-9. Error Rate Check

4-9-1. CD Error Rate Check

Checking Method :

1. Load a test disc TDYS-1.
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES key twice and display "CPLAY MID".
4. "C1 = [illegible] AD = [illegible]" is displayed.
5. Check that the C1 error rate is below 20.
6. Press the NO key, stop playback, press the EJECT key, and remove the test disc.

4-9-2. MO Error Rate Check

Checking Method :

1. Load a continuously recorded disc (Refer to "4-4. Creating MO Continuously Recorded Disc".).
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES key twice and display "CPLAY MID".
4. "C1 = [illegible] AD = [illegible]" is displayed.
5. If the C1 error rate is below 50, check that ADER is 00.
6. Press the NO key, stop playback, press the EJECT key, and remove the continuously recorded disc.

4-10. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

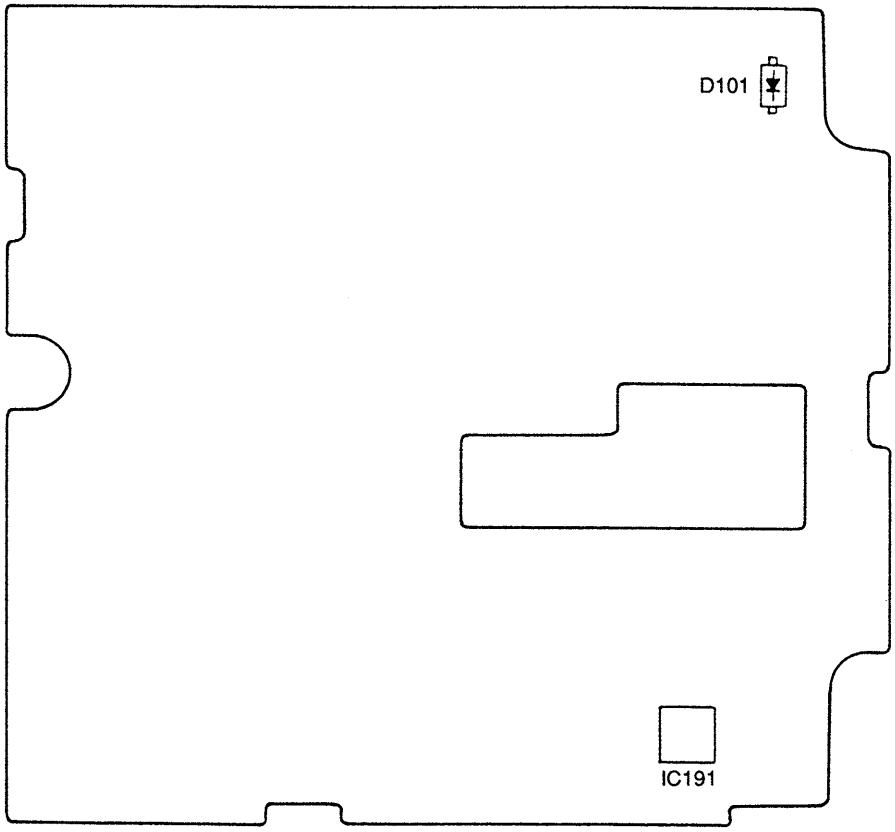
Checking Method :

1. Load a continuously recorded disc (Refer to "4-4. Creating MO Continuously Recorded Disc".).
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES key twice and display "CPLAY MID".
4. Press the NO key when "C1 = [illegible] AD = [illegible]" is displayed.
5. Rotate the AMS knob and display "FBIAS CHECK".
6. Press the YES key and display " [illegible] c = [illegible]".
   The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
   Check that the C1 error is below 50 and ADER is 00.
7. Press the YES key and display " [illegible] b = [illegible]".
   Check that the C1 error is not below 220 and ADER is not above 00 every time.
8. Press the YES key and display " [illegible] a = [illegible]".
   Check that the C1 error is not below 220 and ADER is not above 00 every time.
9. Press the NO key, next press the EJECT key, and remove the continuously recorded disc.

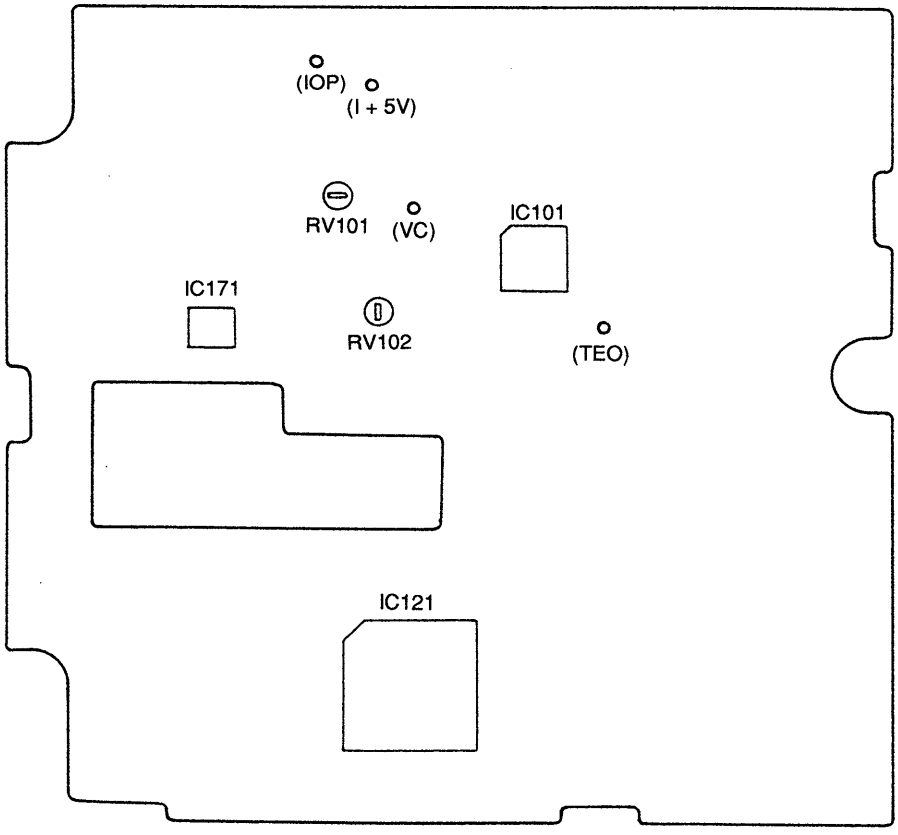
Note 1 : If the C1 error and ADER are above 00 at points a or b, the focus bias adjustment may not have been carried out properly. Adjust perform the beginning again.

4-11. Adjusting Points and Connecting Points

[BD BOARD] (COMPONENT SIDE)

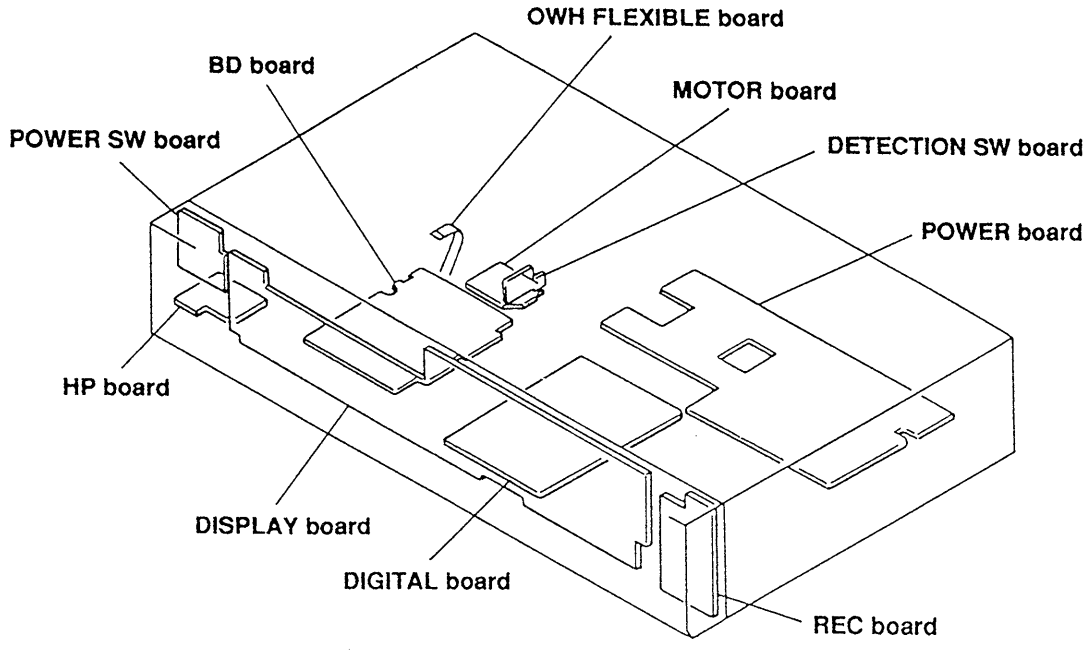


[BD BOARD] (CONDUCTOR SIDE)

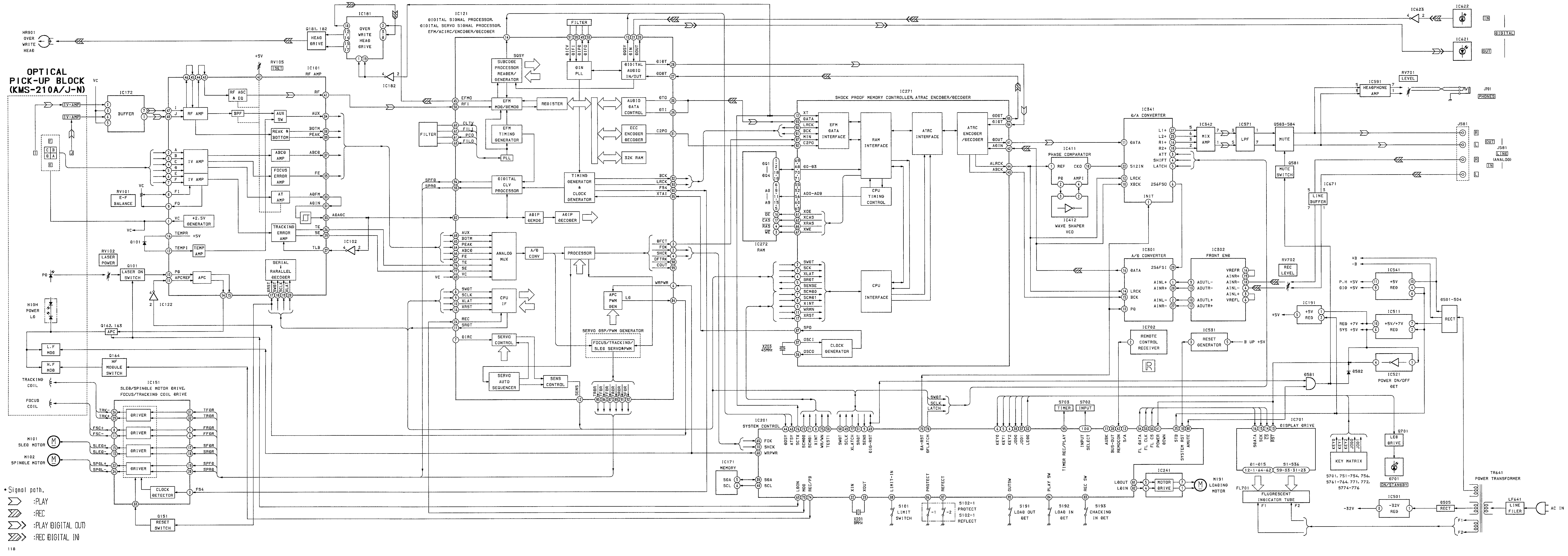


SECTION 5
DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION

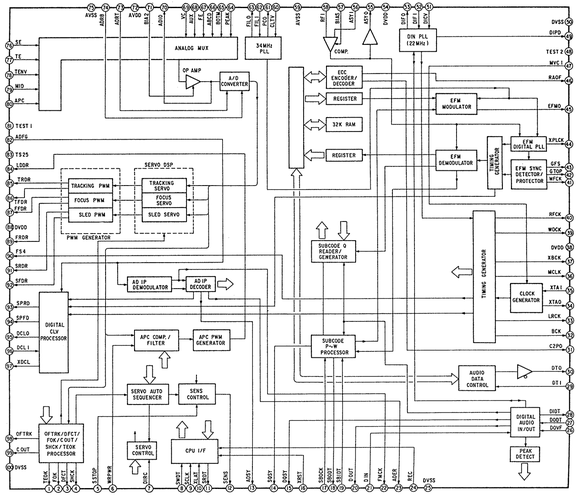


5-2. BLOCK DIAGRAM

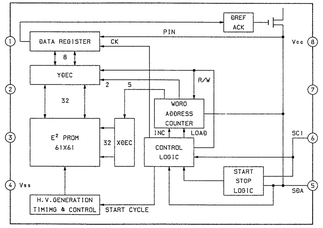

HR901 OVER WRITE HEAD
Q181, 182 HEAD DRIVE
IC181 OVER WRITE HEAD DRIVE
IC182
OPTICAL PICK-UP BLOCK (KMS-210A/J-N)
IV-AMP
IC172 BUFFER
IC101 RF AMP
RV105 ISET
RF AGC & EQ
RF AMP
BPF
AUX SW
PEAK & BOTTOM
ABCD AMP
FOCUS ERROR AMP
AT AMP
IV AMP
RV101 E-F BALANCE
+2.5V GENERATOR
TRACKING ERROR AMP
TEMP AMP
IC102
D101
RV102 LASER POWER
Q101 LASER ON SWITCH
APC
IC122
SERIAL ↓ PARALLEL DECODER
HIGH POWER LD
Q162, 163 APC
L.F MOD
H.F MOD
Q164 HF MODULE SWITCH
TRACKING COIL
FOCUS COIL
IC151 SLED/SPINDLE MOTOR DRIVE, FOCUS/TRACKING COIL DRIVE
DRIVER
CLOCK DETECTOR
Q151 RESET SWITCH
M101 SLED MOTOR
M102 SPINDLE MOTOR
• Signal path.
:PLAY
:REC
:PLAY (DIGITAL OUT)
:REC (DIGITAL IN)
118
IC121 DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO SIGNAL PROCESSOR, EFM/ACIRC/ENCODER/DECODER
SUBCODE PROCESSOR READER/ GENERATOR
EFM MOD/DEMOD
REGISTER
FILTER
EFM TIMING GENERATOR
PLL
DIGITAL CLV PROCESSOR
TIMING GENERATOR & CLOCK GENERATOR
ADIP DEMOD
ADIP DECODER
ANALOG MUX
A/D CONV
PROCESSOR
CPU IF
APC PWM GEN
SERVO CONTROL
SERVO AUTO SEQUENCER
SENS CONTROL
SERVO DSP/PWM GENERATOR
FOCUS/TRACKING/ SLED SERVO&PWM
DIN PLL
DIGITAL AUDIO IN/OUT
AUDIO DATA CONTROL
ECC ENCODER DECODER
32K RAM
IC271 SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER
EFM DATA INTERFACE
RAM INTERFACE
ATRC INTERFACE
ATRC ENCODER /DECODER
CPU TIMING CONTROL
CPU INTERFACE
IC272 RAM
X203 45MHz
CLOCK GENERATOR
IC201 SYSTEM CONTROL
IC171 MEMORY
X201 8MHz
S101 LIMIT SWITCH
S102-1 PROTECT S102-1 REFLECT
S191 LOAD OUT DET
S192 LOAD IN DET
S193 CHACKING IN DET
S703 TIMER
S702 INPUT
IC241 MOTOR DRIVE
M191 LOADING MOTOR
IC341 D/A CONVERTER
IC411 PHASE COMPARATOR
IC412 WAVE SHAPER VCO
IC342 MIX AMP
IC571 LPF
Q583-584 MUTE
Q581 MUTE SWITCH
IC301 A/D CONVERTER
IC302 FRONT END
RV702 REC LEVEL
IC702 REMOTE CONTROL RECEIVER
IC531 RESET GENERATOR
B UP +5V
IC701 DISPLAY DRIVE
D1-D15 12-1·64-62
S1-S36 59-33·31-23
FL701 FLUORESCENT INDICATOR TUBE
KEY MATRIX
S701, 751-754, 756, S761-764, 771, 772, S774-776
Q701 LED DRIVE
D701 ON/STANDBY
IC623
IC622 IN
IC621 OUT
DIGITAL
IC591 HEADPHONE AMP
RV701 LEVEL
J701 PHONES
J581 OUT
J581 LINE (ANALOG) IN
IC671 LINE BUFFER
IC191 +5V REG
IC541 +5V REG
P.H +5V
DIG +5V
IC511 +5V/+7V REG
REG +7V
SYS +5V
D501-504 RECT
D581
D582
IC521 POWER ON/OFF DET
IC501 -32V REG
D505 RECT
TR641 POWER TRANSFORMER
LF641 LINE FILER
AC IN

• IC Block Diagrams

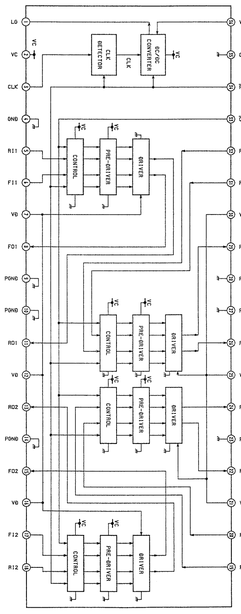
IC121 CXD2535AR



IC171 X24C01S



IC151 MPC17A38VMEL



• Semiconductor Location

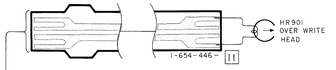
Ref. No.	Location
D101	C-6
D155	F-11
D161	B-8
D181	C-2
D183	C-2
IC101	D-10
IC102	D-11
IC121	F-9
IC122	D-9
IC151	G-12
IC171	D-8
IC172	C-10
IC181	C-12
IC182	C-11
IC191	G-5
Q101	B-9
Q151	F-11
Q162	B-10
Q163	B-8
Q164	B-8
Q181	C-1
Q182	C-1

Note:
- ⊗ : Through hole.
- □ : Pattern from the side which enable seeing. (The other layer's patterns are not indicated.)

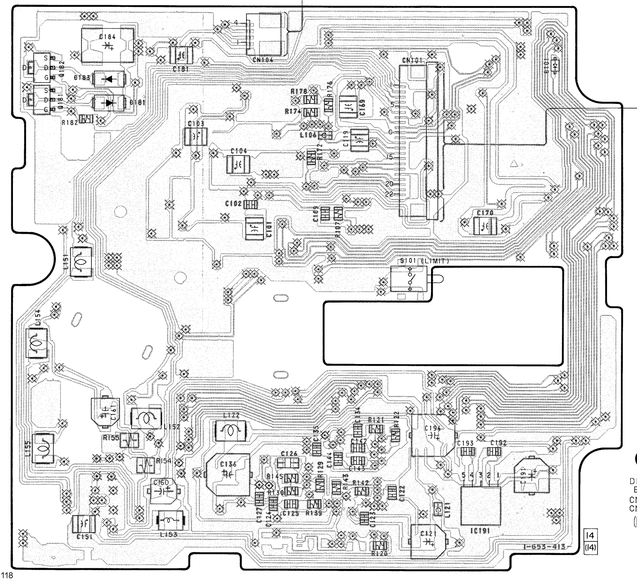
5-3. PRINTED WIRING BOARDS — RF SECTION —

• See page 30 for Circuit Boards Location.

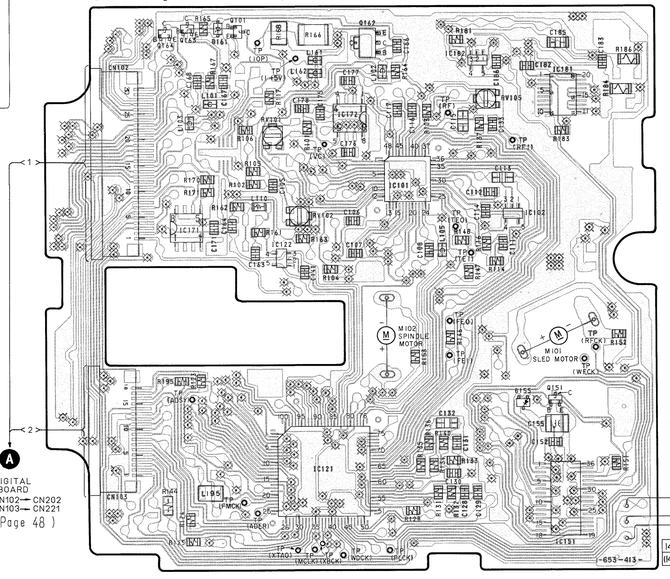
【OWH FLEXIBLE BOARD】



【BD BOARD】(COMPONENT SIDE)



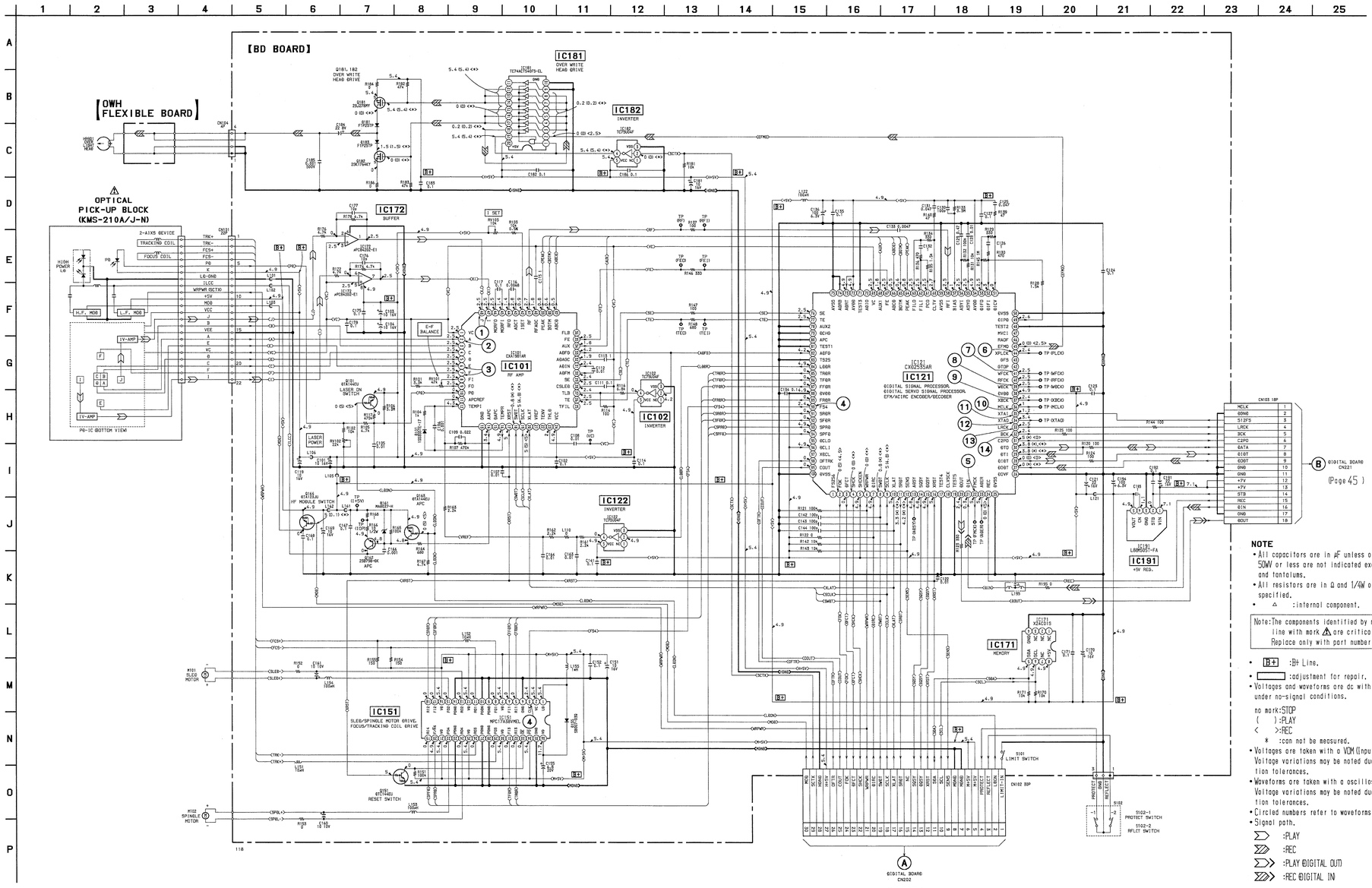
【BD BOARD】(CONDUCTOR SIDE)



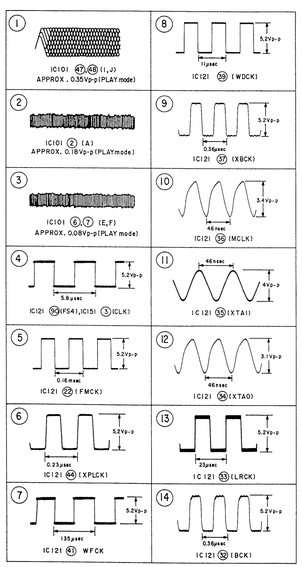
A DIGITAL BOARD CN102→CN202 CN103→CN221 (Page 48)

5-4. SCHEMATIC DIAGRAM — RF SECTION —

• See page 58 for IC Pin Functions. (IC101, IC121)

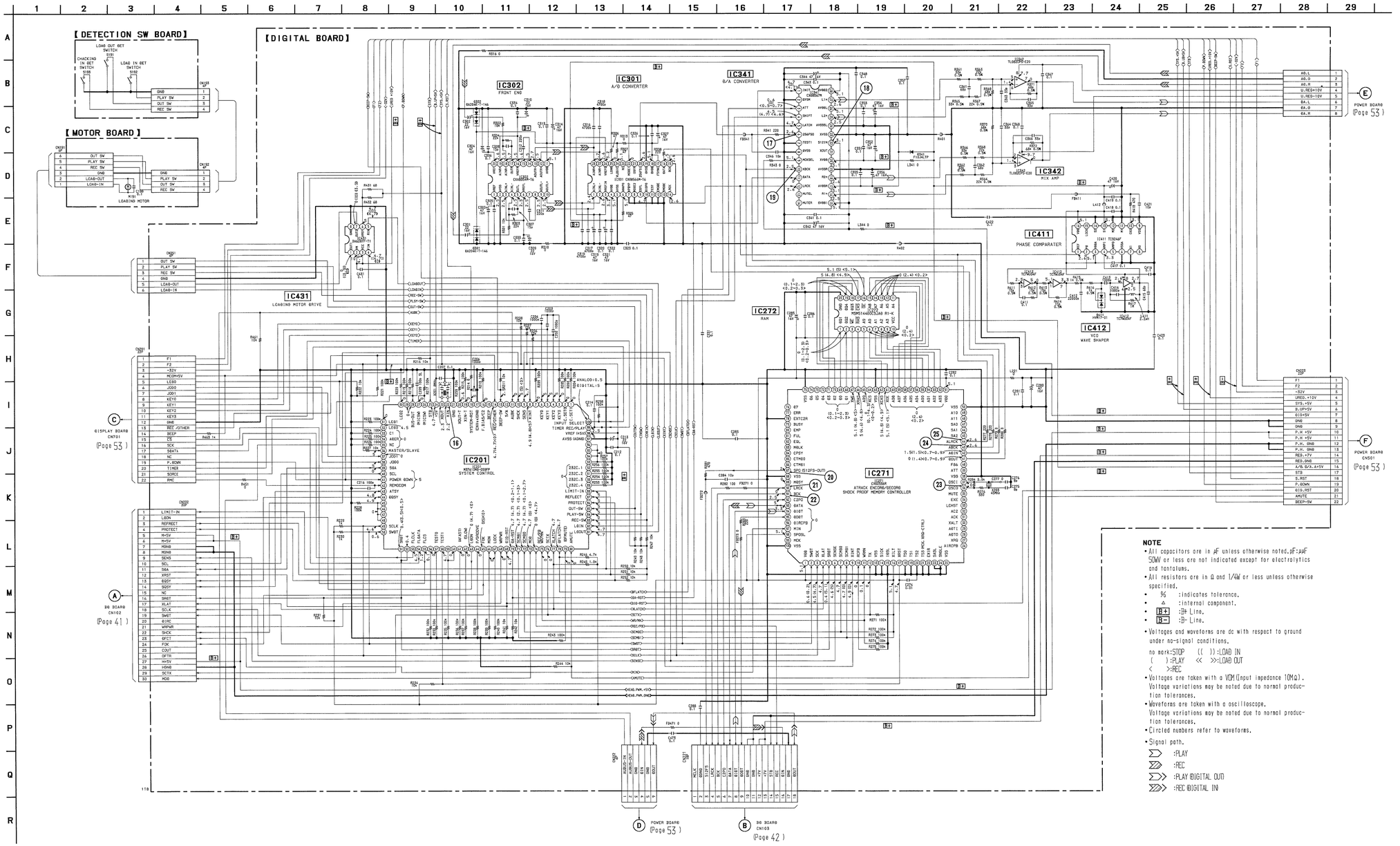

【BD BOARD】
【OWH FLEXIBLE BOARD】
⚠ OPTICAL PICK-UP BLOCK (KMS-210A/J-N)
IC181 OVER WRITE HEAD DRIVE
IC182 INVERTER
IC172 BUFFER
IC101 RF AMP
IC102 INVERTER
IC122 INVERTER
IC121 CXD2653AR DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO SIGNAL PROCESSOR, EFM/ACIRC ENCODER/DECODER
IC151 SLED/SPINDLE MOTOR DRIVE, FOCUS/TRACKING COIL DRIVE
IC171 MEMORY
IC191 +5V REG.
IC131 LA6565D-TA
IC161 XC62D15
S101 LIMIT SWITCH
S102-1 PROTECT SWITCH
S102-2 RFLCT SWITCH
RESET SWITCH
LASER CN SWITCH
HF MODULE SWITCH
SLED MOTOR
SPINDLE MOTOR
CN105 18P
CN102 80P
CN101 22P
CN103 2P
CN104 4P
DIGITAL BOARD CN221
(Page 45)
DIGITAL BOARD CN202
(Page 43)
NOTE
• All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
• All resistors are in Ω and 1/4W or less unless otherwise specified.
• △ : internal component.
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
• B+ : B+ Line.
• : adjustment for repair.
• Voltages and waveforms are dc with respect to ground under no-signal conditions.
no mark: STOP
( ): PLAY
< >: REC
* : can not be measured.
• Voltages are taken with a VOM (input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
• Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
• Circled numbers refer to waveforms.
• Signal path.
: PLAY
: REC
: PLAY ©IGITAL OUT)
: REC ©IGITAL IN

• Waveforms


① IC101 47,48 (I,J) APPROX. 0.35Vp-p (PLAY mode)
② IC101 2 (A) APPROX. 0.18Vp-p (PLAY mode)
③ IC101 6,7 (E,F) APPROX. 0.08Vp-p (PLAY mode)
④ IC121 90 (FS4), CI51 3 (CLK) 5.2Vp-p 5.8μsec
⑤ IC121 22 (FMCK) 5.2Vp-p 0.16msec
⑥ IC121 44 (XPLCK) 5.2Vp-p 0.23μsec
⑦ IC121 41 WFCK 5.2Vp-p 135μsec
⑧ IC121 55 (WDCK) 5.2Vp-p 11μsec
⑨ IC121 57 (XBCK) 5.2Vp-p 0.36μsec
⑩ IC121 56 (MCLK) 3.4Vp-p 46nsec
⑪ IC121 52 (XTAI) 4Vp-p 46nsec
⑫ IC121 54 (XTAO) 3.1Vp-p 46nsec
⑬ IC121 53 (LRCK) 5.2Vp-p 23μsec
⑭ IC121 52 (BCK) 5.2Vp-p 0.36μsec

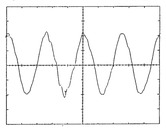
5-5. SCHEMATIC DIAGRAM — DIGITAL SECTION —

• See page 62 for IC Pin Functions. (IC201, IC271)

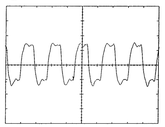


• Waveforms

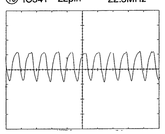
⑯ IC201 22pin 4.5Vp-p 8.13MHz



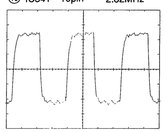
⑰ IC341 6pin 6.1Vp-p 11.3MHz



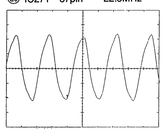
⑱ IC341 22pin 4.2Vp-p 22.3MHz



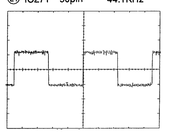
⑲ IC341 10pin 4.9Vp-p 2.82MHz



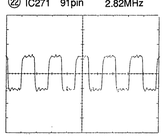
⑳ IC271 87pin 4.6Vp-p 22.3MHz



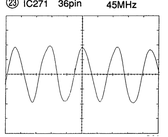
㉑ IC271 90pin 5.2Vp-p 44.1KHz



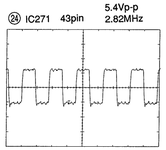
㉒ IC271 91pin 5.1Vp-p 2.82MHz



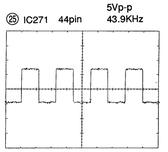
㉓ IC271 36pin 2Vp-p 45MHz



㉔ IC271 43pin 5.4Vp-p 2.82MHz



㉕ IC271 44pin 5Vp-p 43.9KHz



5-6. PRINTED WIRING BOARDS — DIGITAL SECTION —

• See page 30 for Circuit Boards Location.

【DIGITAL BOARD】(SIDE A)

【DIGITAL BOARD】(SIDE B)

(CHASSIS)

DISPLAY BOARD CN701 (Page 55)

(Page 56) POWER BOARD CN222→CN532 CN223→CN501 CN281→CN571

【DETECTION SW BOARD】

【MOTOR BOARD】

(Page 37) BD BOARD CN202→CN102 CN221→CN103

• **Semiconductor Location**

Ref. No.	Location
D301	C-14
D302	E-15
D303	D-2
D341	C-15
D411	C-4
IC201	C-5
IC271	D-10
IC272	C-10
IC301	D-14
IC302	D-15
IC341	C-14
IC342	B-3
IC411	B-4
IC412	B-13
IC431	F-14

Note:

- ○— : parts extracted from the component side.
- • : Through hole.
- ▭ : Pattern from the side which enable seeing. (The other layer's patterns are not indicated.)

• **IC Block Diagrams**

IC271 CXD2536AR

IC301 CXD8566M-T6

IC302 CXA8054M-T6

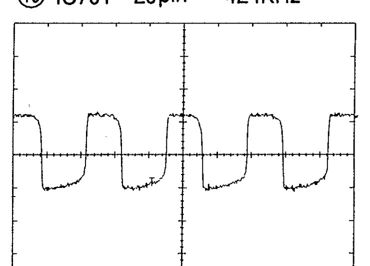
IC341 CXD8567M-T6

IC411 TC9246F-TP1

IC431 BA6287F

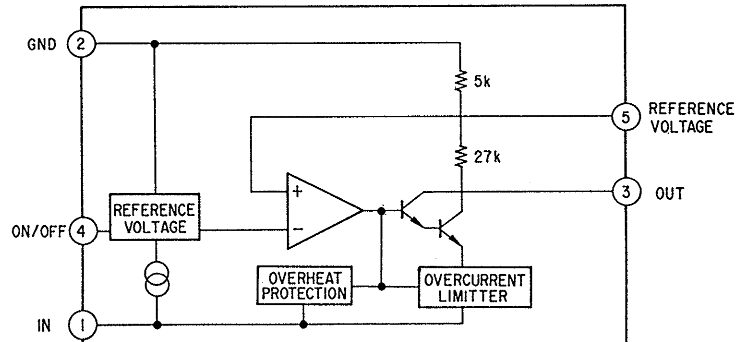
5-7. SCHEMATIC DIAGRAM — DISPLAY/POWER SECTION —

• Waveform

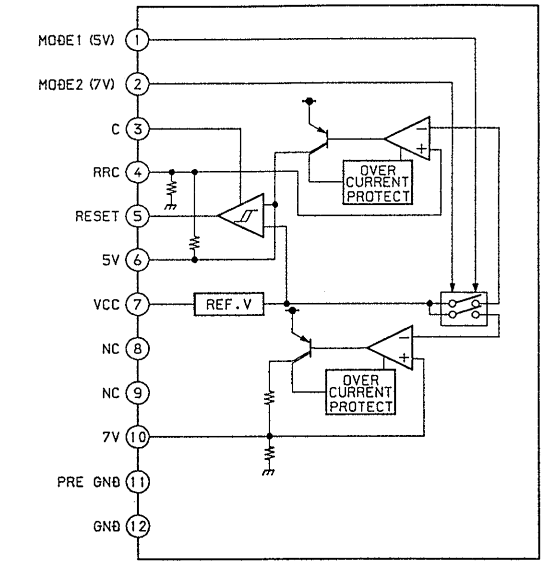


• IC Block Diagrams

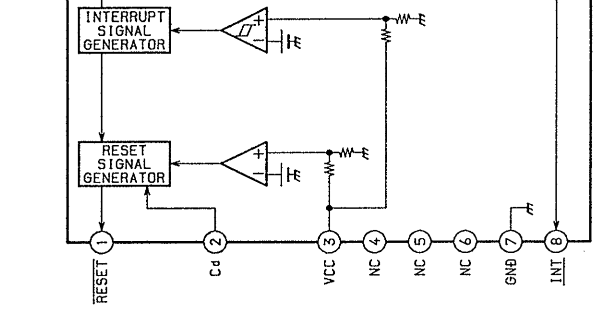
IC501 M5293L

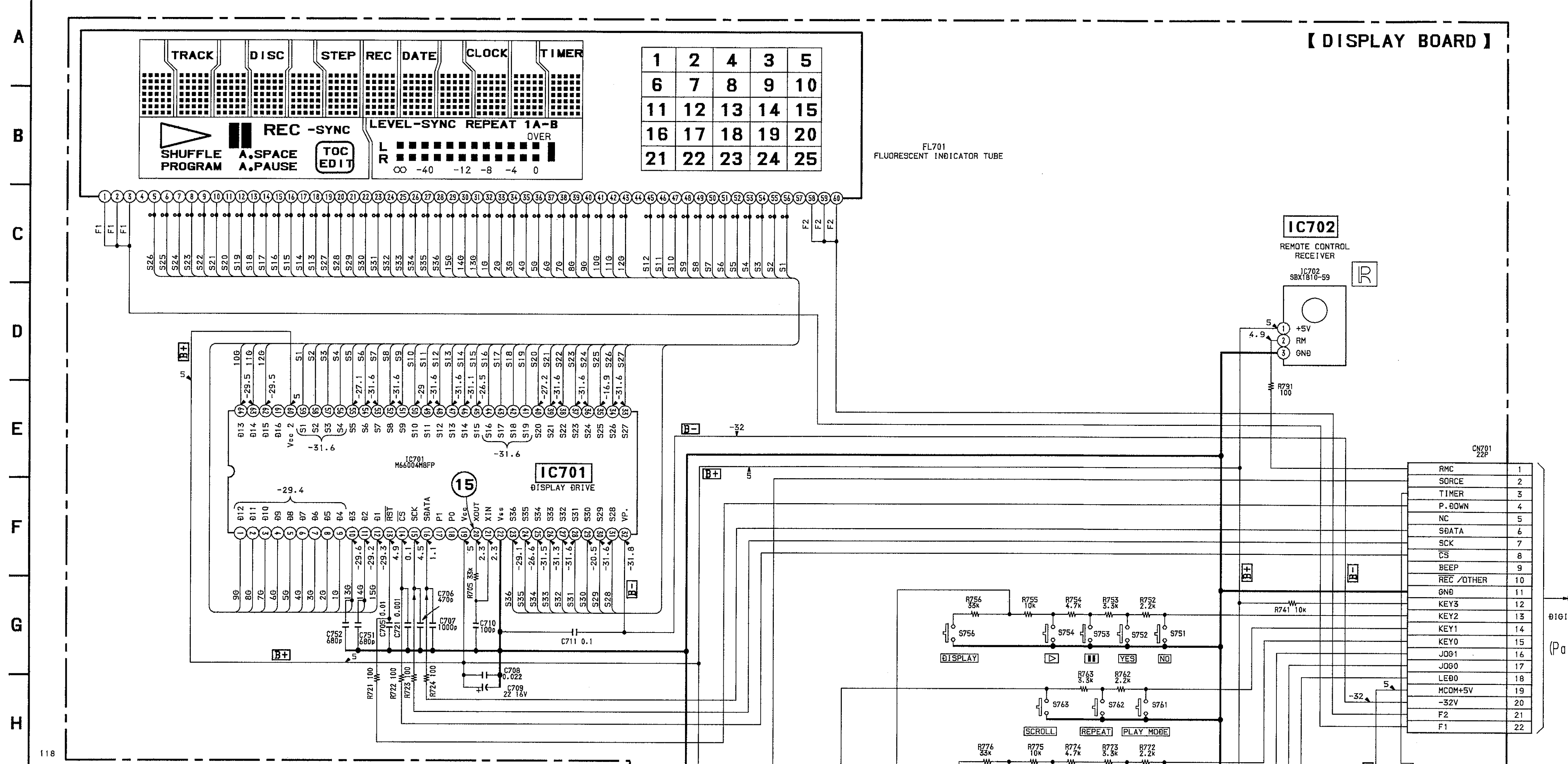


IC511 BA3963



IC531 M62005L



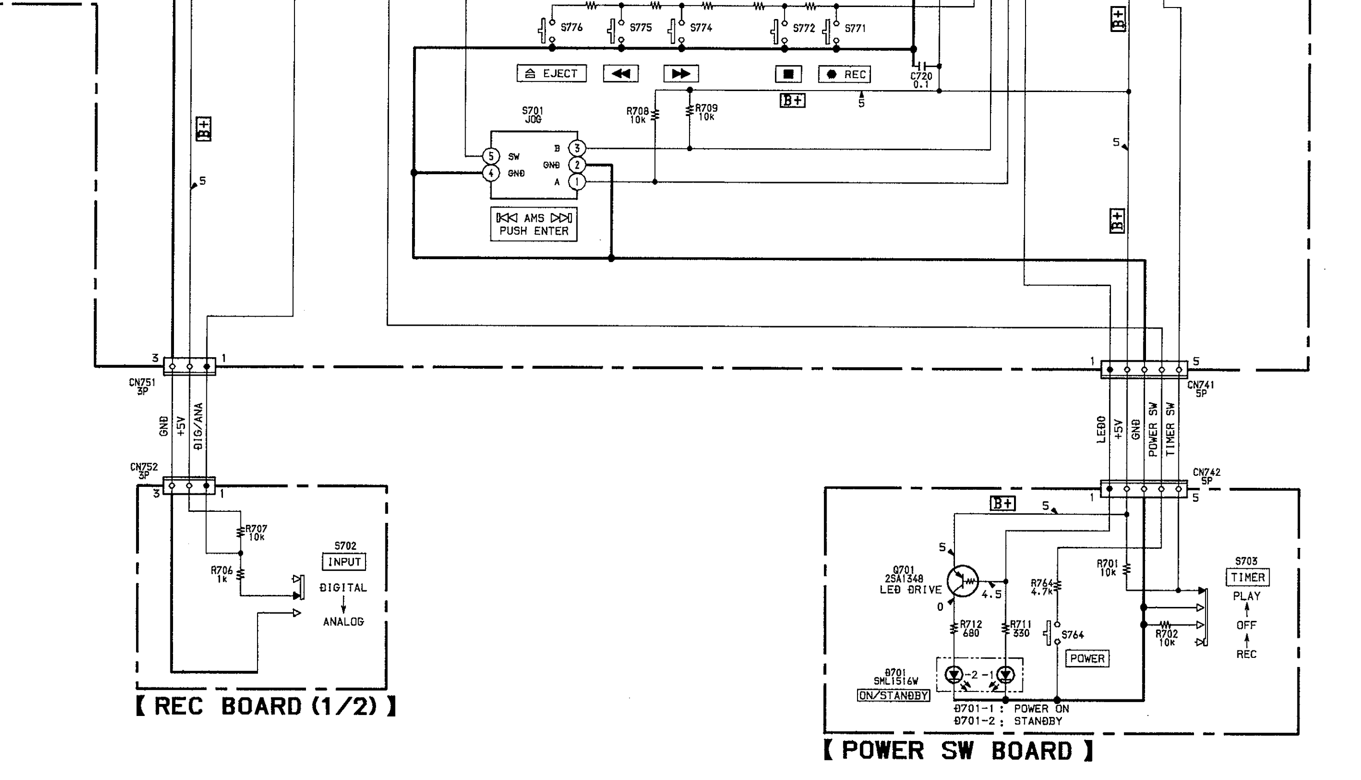


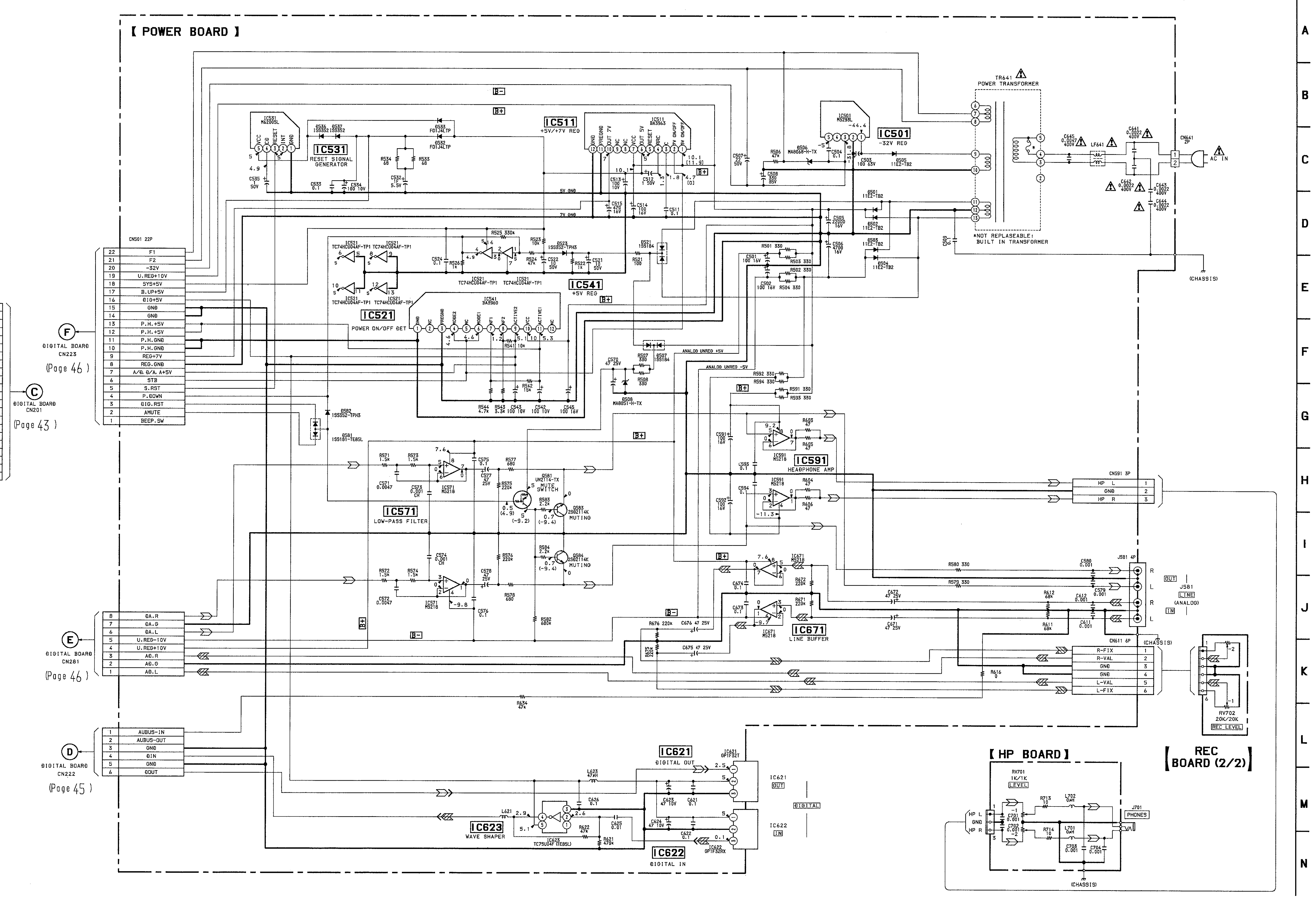
NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % : indicates tolerance.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

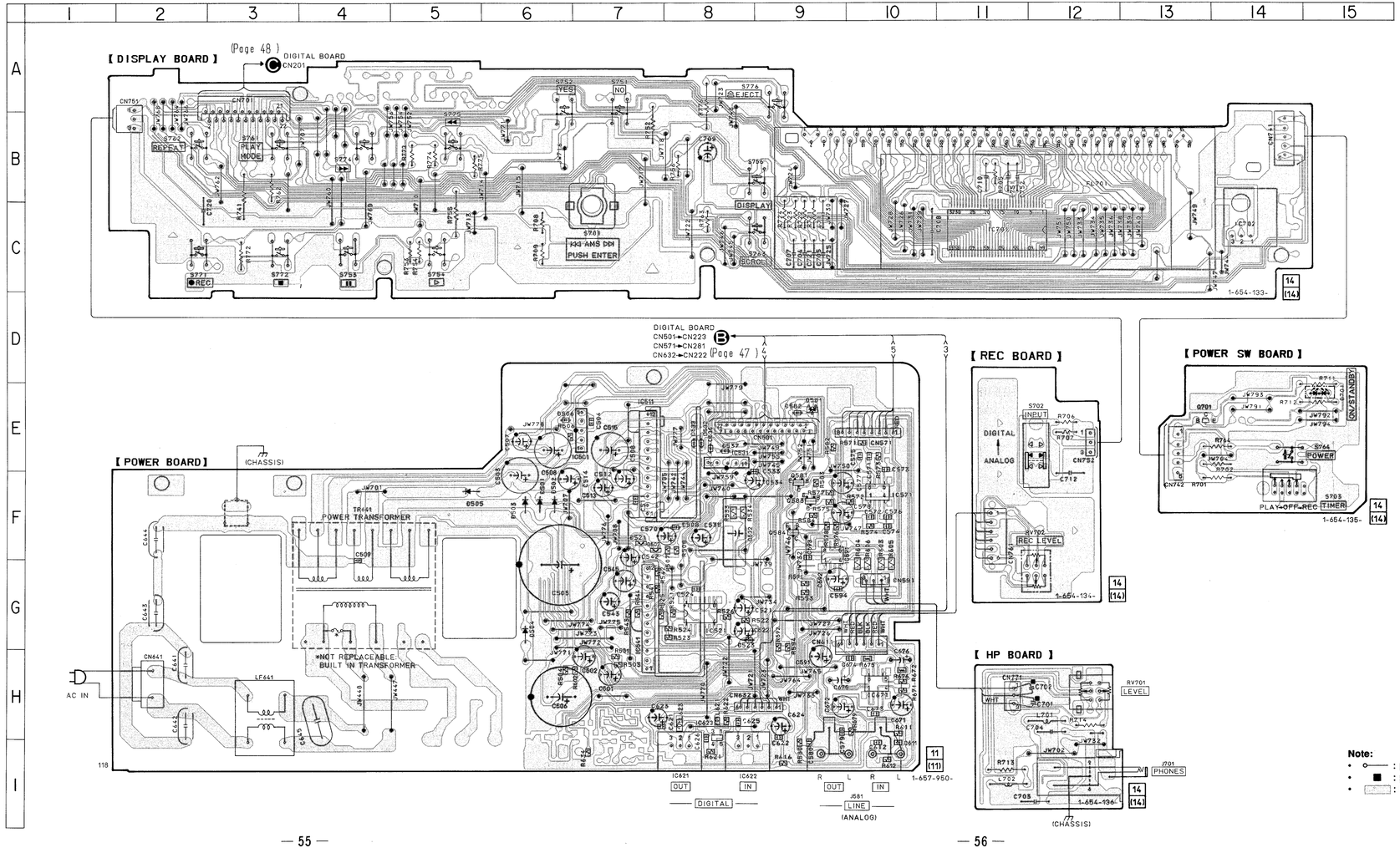
- B+ : B+ Line.
- B- : B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP
  ( ) : PLAY
  [ ] : STANDBY
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⊳ : PLAY
  ⊳ : REC
  ⊳⊳ : PLAY (DIGITAL OUT)
  ⊳⊳ : REC (DIGITAL IN)





5-8. PRINTED WIRING BOARDS — DISPLAY/POWER SECTION —

• See page 30 for Circuit Boards Location.



— 55 —

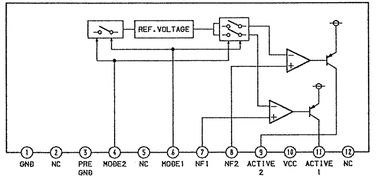
— 56 —

• Semiconductor Location

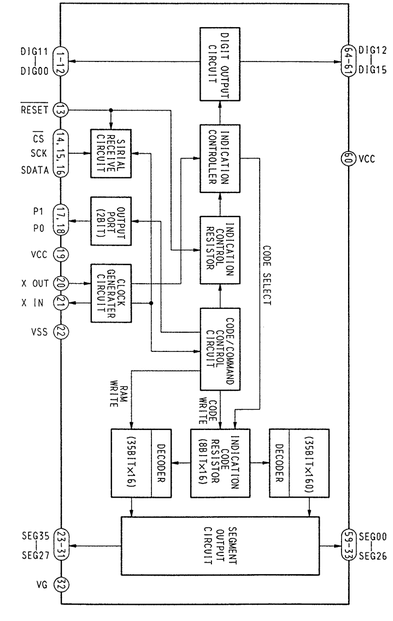
Ref. No.	Location
D501	F-6
D502	F-6
D503	F-6
D504	G-6
D505	F-5
D506	E-6
D507	F-7
D508	F-8
D521	F-7
D523	G-8
D532	E-8
D533	E-8
D536	E-8
D537	E-8
D581	E-9
D582	E-9
D701	E-15
IC501	E-7
IC511	E-7
IC521	G-8
IC531	E-8
IC541	G-7
IC571	F-10
IC591	F-9
IC621	I-8
IC622	I-8
IC623	I-8
IC671	H-10
IC701	C-11
IC702	C-14
Q581	F-9
Q583	F-9
Q584	F-9
Q701	E-13

Note:
- ○—— : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ▨ : Pattern on the side which seen.

IC541 BA3960



IC701 M66004M8FP



— 57 —

5-9. IC PIN FUNCTIONS

• IC101 RF AMP (CXA1981R)

Pin. No.	Signal Name	I/O	Description
1	VC	O	Output terminal for the center point voltage (+2.5V) generated
2−7	A−F	I	Signal input from detector circuit in the optical pick-up block
8	FI	I	Signal (-) input of the operational amplifier for F signal
9	FO	O	Signal output of the operational amplifier for F signal
10	PD	I	Front monitor Connected to the photo diode
11	APCREF	I	Input terminal for the setting of laser power
12	TEMPI	I	Terminal for the connection to temperature sensor
13	GND	−	Ground terminal
14	AAPC	O	LD amplifier output terminal of the APC circuit
15	DAPC	O	Not used (open)
16	TEMPR	O	Output terminal of the reference voltage for temperature sensor
17	XRST	I	Reset signal input from the system controller (IC201) When reset: "L"
18	SWDT	I	Write data signal input from the system controller (IC201)
19	SCLK	I	Clock signal input from the system controller (IC201)
20	XLAT	I	Latch signal input from the system controller (IC201)
21	VREF	O	Reference voltage output Not used this set (open)
22	TENV	O	Not used (open)
23	THLD	I	Not used (connected to the VC)
24	VCC	−	Power supply terminal (+5V)
25	TFIL	I	Not used (open)
26	TE	O	Tracking error signal output to CXD2535AR (IC121)
27	TLB	I	Input terminal of the adder signal to tracking error
28	CSLED	I	Terminal for the sled error lowpass filter
29	SE	O	Sled error signal output to CXD2535AR (IC121)
30	ADFM	O	FM signal output terminal of the ADIP
31	ADIN	I	Input terminal by AC coupling is FM signal of the ADIP
32	ADAGC	I	External capacitor connect terminal for AGC of the ADIP
33	ADFG	O	ADIP double turned FM signal output to CXD2535AR (IC121) (22.05kHz±1kHz)
34	AUX	O	Sub signal output to CXD2535AR (IC121)
35	FE	O	Focus error signal output to CXD2535AR (IC121)
36	FLB	I	Not used (open)
37	ABCD	O	Light amount signal output to CXD2535AR (IC121)
38	BOTM	O	Light amount bottom hold signal output to CXD2535AR (IC121)
39	PEAK	O	Light amount peak hold signal output to CXD2535AR (IC121)
40	RFAGC	I	External capacitor connect terminal of AGC circuit for the RF
41	RF	O	Playback EFM RF signal output to CXD2535AR (IC121)
42	ISET	I	Setting terminal for the internal circuit constant 22KHz, BPF center frequency
43	AGCT	I	Input terminal by AC coupling is RF signal
44	RFO	O	RF signal output terminal
45	MORFI	I	Input terminal by AC coupling is RF signal of the MO
46	MORFO	O	RF signal output terminal of the MO
47, 48	I, J	I	Signal input from detector circuit in the optical pick-up block

• IC121 DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO SIGNAL PROCESSOR, EFM/ACIRC ENCODER/DECODER (CXD2535AR)

Pin. No.	Signal Name	I/O	Description
1	FS256	O	11.2896MHz clock signal output (MCLK system) Not used this set (open)
2	FOK	O	Focus OK signal output to the system controller (IC201) "H" is output when the focus is applied
3	DFCT	O	Defect ON/OFF selection signal output to CXD2536R (IC271)
4	SHCK	O	Track jump detection signal output to the system controller (IC201)
5	SHCKEN	I	Track jump detection enable input Not used this set (Fixed at "H")
6	WRPWR	I	Laser power selection signal input from the system controller (IC201)
7	DIRC	I	Not used this set (Fixed at "H")
8	SWDT	I	Write data signal input from the system controller (IC201)
9	SCLK	I	Serial clock signal input from the system controller (IC201)
10	XLAT	I	Serial latch signal input from the system controller (IC201)
11	SRDT	O	Read data signal output to the system controller (IC201)
12	SENS	O(3)	Internal status (SENSE) output to the system controller (IC201)
13	ADSY	O	ADIP sync signal output Not used this set (open)
14	SQSY	O	Sub-code Q sync (SCOR) output to the system controller (IC201) "L" every 13.3msec, Almost "H"
15	DQSY	O	Digital in U-bit CD format sub-code Q sync (SCOR) output to the system controller (IC201) "L" every 13.3msec, Almost "H"
16	XRST	I	Reset signal input from the system controller (IC201) When reset: "L"
17	TEST4	I	Test input terminal (Fixed at "L")
18	CLVSCK	O	Not used this set (open)
19	TEST5	I	Test input terminal (Fixed at "L")
20	DOUT	O	Output terminal of the digital audio signal (for optical out)
21	DIN	I	Input terminal of the digital audio signal (for optical in)
22	FMCK	O	FM modulation clock signal output of the ADIP
23	ADER	O	ADIP CRC flag output When error: "H"
24	REC	I	Record/playback selection signal input from the system controller (IC201) When recording: "H", When playback: "L"
25	DVSS	—	Ground terminal (Digital system)
26	DOVF	I	Validity flag input terminal for the digital audio out (Fixed at "L")
27	DODT	I	Input terminal of 16-bit data signal for the digital audio out from CXD2536R (IC271)
28	DIDT	O	Output terminal of 16-bit data signal for the digital audio in to CXD2536R (IC271)
29	DTI	I	Record audio data signal input from CXD2536R (IC271)
30	DTO	O(3)	Playback audio data signal output to CXD2536R (IC271)
31	C2PO	O	C2PO (indicate the error state of the data) signal output to CXD2536R (IC271) Playback: C2PO("H"), Digital recording: D.In-Vflag, Analog recording: "L"
32	BCK	O	Bit clock (2.8224MHz) signal output to CXD2536R (IC271) (MCLK system)
33	LRCK	O	L/R clock (44.1kHz) signal output to CXD2536R (IC271) (MCLK system)
34	XTAO	O	System clock (512Fs=22.5792MHz) signal output Not used this set (open)
35	XTAI	I	System clock (512Fs=22.5792MHz) signal input from CXD2536R (IC271)

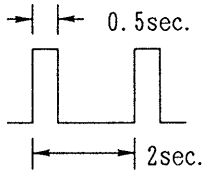
Pin. No.	Signal Name	I/O	Description
36	MCLK	O	MCLK clock (22.5792MHz) signal output
37	XBCK	O	BCK (pin 32) inverted output
38	DVDD	—	Power supply terminal (+5V) (Digital system)
39	WDCK	O	WDCK clock (88.2kHz) signal output (MCLK system)
40	RFCK	O	RFCK clock (7.35kHz) signal output (MCLK system)
41	WFCK	O	WFCK clock (7.35kHz) signal output (When playback: EFM decoder PLL system, When recording: EFM encoder PLL system)
42	GTOP	O	Opens the playback EFM frame sync protection window when "H"
43	GFS	O	The playback EFM frame sync and interpolation protection timing match when "H"
44	XPLCK	O	EFM decoder PLL clock (98Fs=4.3218MHz) signal output Falling edge of the EFM PLL clock and the EFM signal match
45	EFMO	O	EFM signal output (When recording)
46	RAOF	O	Overflow detection signal output of the internal RAM (Decoder monitor out) RAOF is a signal generated when the 32k RAM exceeds the ±4F jitter margin
47	MVCI	I	Oscillation input for PLL of the digital in Not used this set (Fixed at"L")
48	TEST2	I	Test input terminal (Fixed at "L")
49	DIPD	O(3)	Phase comparator output for PLL of the digital in When the internal VCO: Frequency; Low→"H", When the external VCO: Frequency; Low→"L"
50	DVSS	—	Ground terminal (Digital system)
51	DICV	I(A)	Control voltage input terminal of the internal VCO for digital in PLL
52	DIFI	I(A)	Filter input terminal of the internal VCO for digital in PLL
53	DIFO	O(A)	Filter output terminal of the internal VCO for digital in PLL
54	AVDD	—	Power supply terminal (+5V) (Analog system)
55	ASYO	O	Playback EFM full-swing output (L=VSS, H=VDD)
56	ASYI	I(A)	Playback EFM asymmetry comparate voltage input terminal
57	BIAS	I(A)	Playback EFM asymmetry circuit constant current input terminal
58	RFI	I(A)	Playback EFM RF signal input from CXA1981R (IC101)
59	AVSS	—	Ground terminal (Analog system)
60	CLTV	I(A)	VCO control voltage input terminal of the PLL for decoder PLL master clock
61	PCO	O(3)	Phase comparator output terminal of the PLL for decoder PLL master clock
62	FILI	I(A)	Filter input terminal of the PLL for decoder PLL master clock
63	FILO	O(3)	Filter output terminal of the PLL for decoder PLL master clock
64	PEAK	I(A)	Light amount peak hold signal input from CXA1981R (IC101)
65	BOTM	I(A)	Light amount bottom hold signal input from CXA1981R (IC101)
66	ABCD	I(A)	Light amount signal input from CXA1981R (IC101)
67	FE	I(A)	Focus error signal input from CXA1981R (IC101)
68	AUX1	I(A)	Sub signal input from CXA1981R (IC101)
69	VC	I(A)	Center point voltage (+2.5V) input from CXA1981R (IC101)
70	ADIO	O(A)	Monitor output of the A/D converter input signal

Pin. No.	Signal Name	I/O	Description
71	TEST3	I(A)	Test input terminal (Fixed at "L")
72	AVDD	—	Power supply terminal (+5V) (Analog system)
73	ADRT	I(A)	A/D converter action limits (upper side) voltage input (Fixed at "H")
74	ADRB	I(A)	A/D converter action limits (lower side) voltage input (Fixed at "L")
75	AVSS	—	Ground terminal (Analog system)
76	SE	I(A)	Sled error signal input from CXA1981R (IC101)
77	TE	I(A)	Tracking error signal input from CXA1981R (IC101)
78	AUX2	I(A)	Sub signal input terminal (2) Not used this set (Fixed at "L")
79	DCHG	I(A)	Connected to the ground
80	APC	I(A)	Input terminal for the laser APC Not used this set (Fixed at "L")
81	TEST1	I	Test input terminal (Fixed at "L")
82	ADFG	I	ADIP double turned FM signal input from CXA1981R (IC101) (22.05kHz±1kHz) (TTL schmidt input)
83	TS25	I	Test input terminal (Fixed at "L")
84	LDDR	O	Laser APC signal output
85	TRDR	O	Tracking servo drive signal output (−)
86	TFDR	O	Tracking servo drive signal output (+)
87	FFDR	O	Focus servo drive signal output (+)
88	DVDD	—	Power supply terminal (+5V) (Digital system)
89	FRDR	O	Focus servo drive signal output (−)
90	FS4	O	176.4kHz clock signal output (MCLK system)
91	SRDR	O	Sled servo drive signal output (−)
92	SFDR	O	Sled servo drive signal output (+)
93	SPRD	O	Spindle servo drive signal output (−)
94	SPFD	O	Spindle servo drive signal output (+)
95	DCLO	O	Not used (open)
96	DCLI	I	Not used (Fixed at "H")
97	XDCL	O	Not used (open)
98	OFTRK	O	Offtrack signal output
99	COUT	O	Traverse count signal output
100	DVSS	—	Ground terminal (Digital system)

* (3) of I/O is state output and (A) is analog output.

• IC201 SYSTEM CONTROLLER (M37610MD-052FP)

Pin. No.	Signal Name	I/O	Description
1	C.SET 1	I	Fixed at "L"
2	C.SET 0	I	Fixed at "L"
3	KEY 3	I	Key input terminal Not used this set (Fixed at "L")
4—6	KEY 2—KEY 0	I	Key input terminal (A/D input) *1
7		I	Fixed at "L"
8	XINT	I	Interruption status input from CXD2536R (IC271)
9	SENS	I	Internal status (SENSE) input from CXD2535AR (IC121)
10	SHCK	I	Track jump signal input from CXD2535AR (IC121)
11	AUBK	I	Audio bus signal input (Not used this set)
12	$\overline{S}$/A	O	Sircs remote controller/audio bus selection signal output (Not used this set)
13	BEEP SW	I	Fixed at "L"
14	$\overline{REC}$/OTHER	O	When recording: "L", Others: "H" (Not used this set)
15	BEEP	O	Buzzer signal output (Not used this set)
16	F.BIAS/C2	I	Fixed at "L"
17	GND (CNVSS)	—	Ground terminal
18	SYSTEM RST	I	System reset signal input "H" after several hundred ms of "L" after power start-up
19	XIN T	I	Not used this set (Fixed at "L")
20	XOUT T	O	Not used this set (Fixed at "L")
21	GND	—	Ground terminal
22	XIN	I	8MHz crystal oscillator input
23	XOUT	O	8MHz crystal oscillator output
24	+5V	—	Power supply terminal (+5V)
25	STB	O	Strobe signal output to the power supply circuit When power ON: "H", When standby: "L"
26, 27	MIC SW	I	Fixed at "L"
28	BUS OUT	O	Audio bus signal output (Not used this set)
29		I	Fixed at "L"
30, 31	LED 2, LED 1	I	Not used this set (Connected to the ground)
32	LED 0	O	Drive signal output to LED (D701) for the power ON/standby indicator When power ON: "H", When standby: "L"
33	C1	I	Fixed at "L"
34	ADER	I	Fixed at "L"
35	N.C.	I	Fixed at "L"
36	MASTER/SLAVE	I	Master/slave selection signal input (Fixed at "H")
37, 38	JOG 1, JOG 0	I	JOG dial pulse input from the rotary encoder (S701)
39	SDA	I/O	Backup memory (IC171) data bus
40	SCL	O	Clock signal output to the backup memory (IC171)
41	POWER DOWN	I	Power down detection input Normally: "H" input
42	REMOCON	I	Remote control signal input
43	ATSY	I	ATP address sync or sub-code Q sync (SCOR) input from CXD2535AR (IC121) "L" every 13.3msec, Almost "H"
44	DQSY	I	Input the U-bit CD format sub-code Q sync (SCOR) of the digital in from CXD2535AR (IC121) "L" every 13.3msec, Almost "H"
45—48		I	Fixed at "L"

Pin. No.	Signal Name	I/O	Description
49	SCLK	O	Clock signal output to the serial bus
50	SWDT	O	Write data signal output to the serial bus
51	SRDT	I	Read data signal input from the serial bus
52		I	Connected to the pin 51
53	FLCLK	O	Serial clock signal output to the display driver (IC701)
54	FLDATA	O	Serial data signal output to the display driver (IC701)
55	FLCS	O	Chip select signal output to the display driver (IC701)
56		I	Fixed at "L"
57	TEST 0	I	Fixed at "L"
58	TEST 1	O	Reset signal output to CXD2536R (IC271)
59, 60		I	Fixed at "L"
61	AFAST	I	Fixed at "L"
62	SLOW	I	Fixed at "L"
63	LDON	O	Laser ON/OFF control signal output When laser ON: "H"
64	P/GROOVE	I	PIT/GROOVE detection input "H": Disc for playing and TOC area Not used this set (Fixed at "L")
65	FOK	I	Focus OK signal input from CXD2535AR (IC121) "H" is input when the focus is applied
66	MON	I	Not used this set (Input and the pull-down)
67	LOCK	O	Not used this set (Output and the pull-down)
68	WRPWR	O	Laser power selection signal output to the optical pick-up block and CXD2535AR (IC121)
69	DIG RST	O	Reset signal output to CXA1981R (IC101), CXD2535AR (IC121), and the motor driver (IC151) When reset: "L"
70	DA RST	O	Reset signal output to D/A converter (IC341) and the A/D converter (IC301) When reset: "L"
71, 72	SCMD1, SCMD0	O	Serial command control mode signal output to CXD2536R (IC271)
73	MOD	O	Laser modulation selection signal output When playback power: "L", When stop: "H", When recording power: 
74	REC/PB	O	Recording/playback selection signal output to CXD2535AR (IC121) When recording: "H", When playback: "L"
75	WR/MN	O	Write/monitor mode selection signal output to CXD2536R (IC271)
76	SCTX	O	Writing data transmission timing output to CXD2536R (IC271) Used together with the magnetic field head ON/OFF output
77	XLATCH	O	Latch signal output to the serial bus
78	DFLATCH	O	Latch signal output to the D/A converter (IC341)
79	DFMUTE	O	Muting signal output Not used this set (Connected to the ground)
80	AMUTE	O	Line out muting signal output
81	LDOUT	O	Loading motor (M191) control output *2
82	LDIN	O	Loading motor (M191) control output *2
83	CHKIN	I	Detection signal input from the chucking in switch (S193) When chucking: "L"

Pin. No.	Signal Name	I/O	Description
84	INSW	I	Detection signal input from the loading in switch (S192) "L" at the position where the head descends, Others: "H"
85	OUTSW	I	Detection signal input from the loading out switch (S191) "L" at the position of load out, Others: "H"
86	PROTECT	I	Rec proof detection signal input from the protect detector switch (S102-1) When protect: "H"
87	REFLECT	I	Disc reflection rate detection signal input from the reflect detector switch (S102-2) "H": Low reflection rate disc
88	LIMIT IN	I	Detection signal input from the limit in switch (S101) When sled limit in: "L"
89—92	232C.4— 232C.1	I	Input terminal for the RS232C expansion Not used this set (Fixed at "L")
93—96		I	Fixed at "L"
97	AVSS (AGND)	—	Ground terminal
98	VREF (+5V)	I	Reference voltage input (+5V)
99	TIMER REC/ PLAY	I	Timer record/timer playback/timer OFF selection signal input terminal When timer recording: "H", When timer playback: "L", When timer OFF: Center point voltage (+2.5V)
100	INPUT SELECT	I	Analog/digital in selection signal input terminal When analog in: "L", When digital in: "H"

*1 Key input

Terminal \ Voltage	0V	0.9V	1.75V	2.5V	3.4V	4.2V	5V
KEY 0 pin 6	S771 ●	S772 ■		S774 ▶▶	S775 ◀◀	S776 ⏏EJECT	No key input
KEY 1 pin 5	S761 PLAY MODE	S762 REPEAT	S763 SCROLL	S764 POWER			No key input
KEY 2 pin 4	S751 EDIT NO	S752 YES	S753 ▯▯	S754 ▷		S756 DISPLAY	No key input

*2 Loading motor control

Terminal \ Mode	IN	OUT	BRAKE
LDIN pin 82	"H"	"L"	"H"
LDOUT pin 81	"L"	"H"	"H"

• IC271 SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER (CXD2536R)

Pin. No.	Signal Name	I/O	Description
1	VDD	—	Power supply terminal (+5V)
2	SWDT	I	Write data signal input from the system controller (IC201)
3	SCK	I	Serial clock signal input from the system controller (IC201)
4	XLAT	I	Serial latch signal input from the system controller (IC201)
5	SRDT	O/Z	Read data signal output to the system controller (IC201)
6	SENSE	O/Z	Internal status (SENSE) output to the system controller (IC201)
7	SCMD0	I	Serial command control mode input from the system controller (IC201)
8	SCMD1	I	Serial command control mode input from the system controller (IC201)
9	XINT	O	Interruption status output to the system controller (IC201)
10	RCPB	I	Record/playback selection signal input Not used this set (Fixed at "L")
11	WRMN	I	Write/monitor mode selection signal input from the system controller (IC201)
12	TX	I	Writing data transmission timing input from the system controller (IC201) Used together with the magnetic field head ON/OFF output
13	VSS	—	Ground terminal
14	SICK	I	Chip reserve terminal (Fixed at "L")
15	IDSL	I	Chip reserve terminal (Fixed at "L")
16	XILT	I	Chip reserve terminal (Fixed at "H")
17	XRST	I	Reset signal input from the system controller (IC201) When reset: "L"
18—21	TS0—TS3	I	Test input terminal (Fixed at "L")
22	EXIR	I	Chip reserve terminal (Fixed at "H")
23	SASL	I	Single use the block selection "L": ATRAC, "H": RAM controller (Fixed at "L")
24	SNGLE	I	Normally fixed at "L", Fixed at "H" when the ATRAC or RAM controller is single used Fixed at "L"
25	VSS	—	Ground terminal
26	AIRCPB	O	Record/playback mode signal output terminal of the ATRAC or external audio block
27	XRQ	I/O	XRQ signal input/output terminal of the ATRAC interface
28	ADTO	I/O	Decoder data signal input/output terminal of the ATRAC
29	ADTI	I/O	Encoder data signal input/output terminal of the ATRAC
30	XALT	I/O	XALT signal input/output terminal of the ATRAC interface
31	ACK	I/O	ACK signal input/output terminal of the ATRAC interface
32	AC2	I/O	Error data signal input/output terminal of the ATRAC interface
33	LCHST	I/O	Lch Start data signal input/output terminal of the ATRAC interface
34	EXE	I/O	EXE signal input/output terminal of the ATRAC interface
35	MUTE	I/O	MUTE signal input/output terminal of the ATRAC interface
36	OSCO	O	45MHz clock oscillation output
37	OSCI	I	45MHz clock oscillation input
38	VSS	—	Ground terminal
39	ATT	I/O	ATT signal input/output terminal of the ATRAC interface
40	F86	O	11.6msec timing signal output terminal of the ATRAC block
41	DOUT	O	Monitor/audio decode data signal output to the D/A converter (IC341)
42	ADIN	I	Recording data signal input from the A/D converter (IC301)
43	ABCK	O	Bit clock signal output to the A/D, D/A converter (IC301, IC341)

Pin. No.	Signal Name	I/O	Description
44	ALRCK	O	L/R clock signal output to the A/D, D/A converter (IC301, IC341)
45−47	SA2−SA0	O	Address signal output Not used this set (open)
48, 49	A11, A10	O	Address signal output Not used this set (open)
50	VSS	−	Ground terminal
51	VDD	−	Power supply terminal (+5V)
52−55	A03−A00	O	Address signal output to the RAM (IC272)
56−60	A04−A08	O	Address signal output to the RAM (IC272)
61	XOE	O	Output enable control signal output to the RAM (IC272)
62	XCAS	O	Column address strobe signal output to the RAM (IC272)
63	VSS	−	Ground terminal
64	XCS	O	Chip select signal output to the RAM (IC272)
65	A09	O	Address signal output to the RAM (IC272)
66	XRAS	O	Row address strobe signal output to the RAM (IC272)
67	XWE	O	Write enable control signal output to the RAM (IC272)
68, 69	D1, D0	I/O	RAM (IC272) data bus
70, 71	D2, D3	I/O	RAM (IC272) data bus
72−74	D4−D6	I/O	Data bus Not used this set (open)
75	VSS	−	Ground terminal
76	D7	I/O	Data bus Not used this set (open)
77	ERR	I/O	Input/output terminal of the error (C2PO) data signal to the external RAM Not used this set (open)
78	EXTC2R	I	External RAM selection signal input for the error data writing (When "H": External RAM) Fixed at "L"
79	BUSY	O	BUSY signal output of the RAM access Not used this set (open)
80	EMP	O	Empty or before the full of the ATRAC data (When DSC=ASC+1: "H")
81	FUL	O	Full or before the empty of the ATRAC data (When ASC=DSC+1: "H")
82	EQL	O	Empty of the ATRACK data (When DSC=ASC: "H")
83	MDLK	O	Indicate the main/sub of the recording or playback data (When the sub and linking: "H", When the main: "L")
84	CPSY	O	Interpolation sync signal output
85	CTMD0	O	DSC counter mode output
86	CTMD1	O	DSC counter mode output
87	SPO	O	System clock (512Fs=22.5792MHz) signal output to CXD2535AR (IC271)
88	VSS	−	Ground terminal
89	MDSY	O	Sync detection signal output of the main data
90	LRCK	I	L/R clock (44.1kHz) signal input from CXD2535AR (IC271)
91	BCK	I	Bit clock (2.8224MHz) signal input from CXD2535AR (IC271)
92	C2PO	I	C2PO (indicate the error mode of the data) signal input from CXD2535AR (IC271) When playback: C2PO ("H"), When digital recording: D.IN-Vflag, When analog recording: "L"
93	DATA	I/O	When recording: Record audio data signal output to CXD2535AR (IC271), When playback: Playback audio data signal input from CXD2535AR (IC271)
94	DIDT	I	16-bit data input terminal for the digital audio in from the CXD2535AR (IC271)
95	DODT	O	16-bit data output terminal for the digital audio out from the CXD2535AR (IC271)

Pin. No.	Signal Name	I/O	Description
96	DIRCPB	O	Disc drive, Record or playback mode output of the EFM encoder/decoder Not used this set (open)
97	MIN	I	Defect ON/OFF selection signal input from CXD2535AR (IC121)
98	SPOSL	I	IN/OUT selection input terminal of the pin 87 ("L":IN, "H":OUT) Fixed at "H"
99	MCKT1	O	Internal master clock signal output terminal of the RAM controller
100	VSS	—	Ground terminal

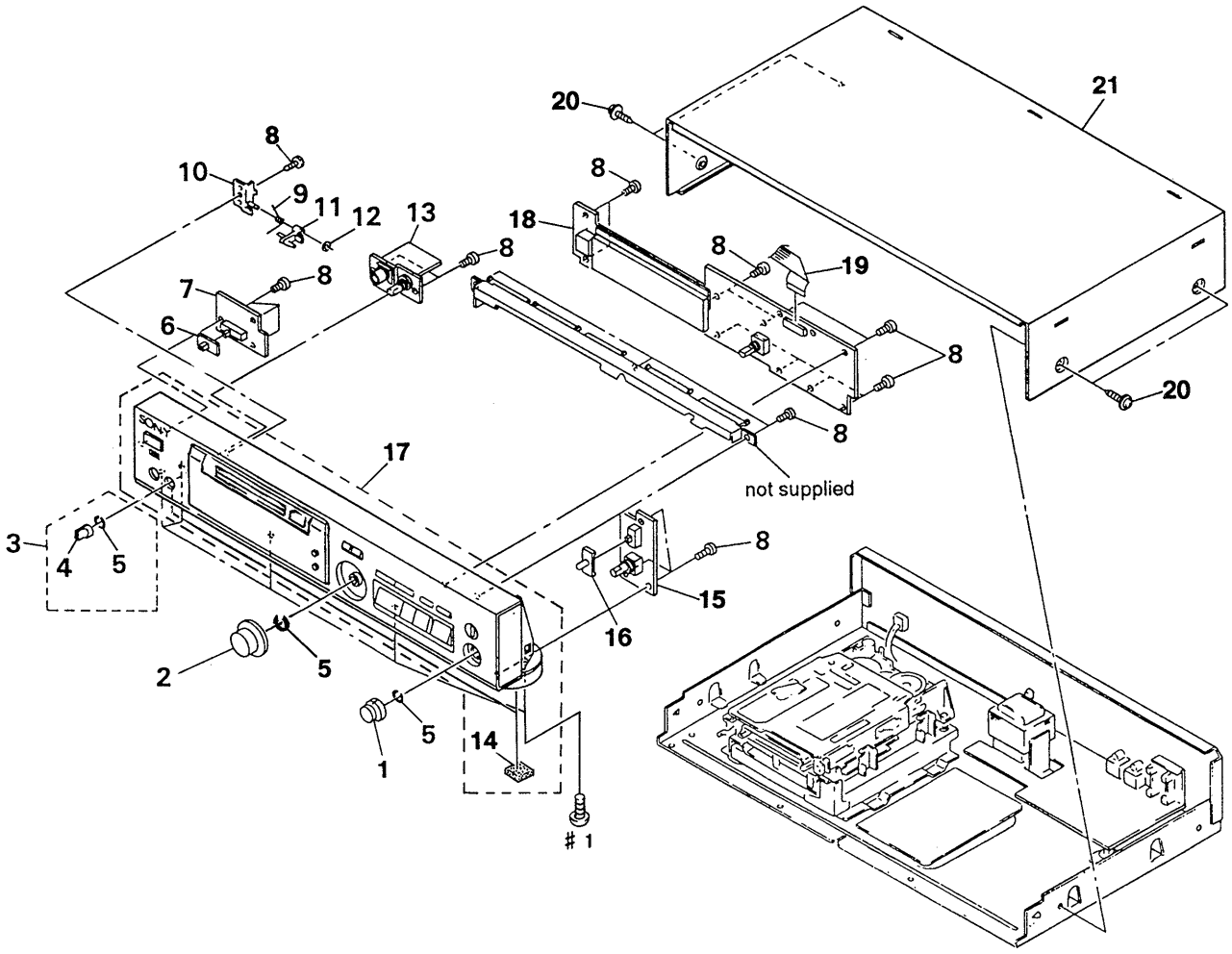
SECTION 6
EXPLODED VIEWS

NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

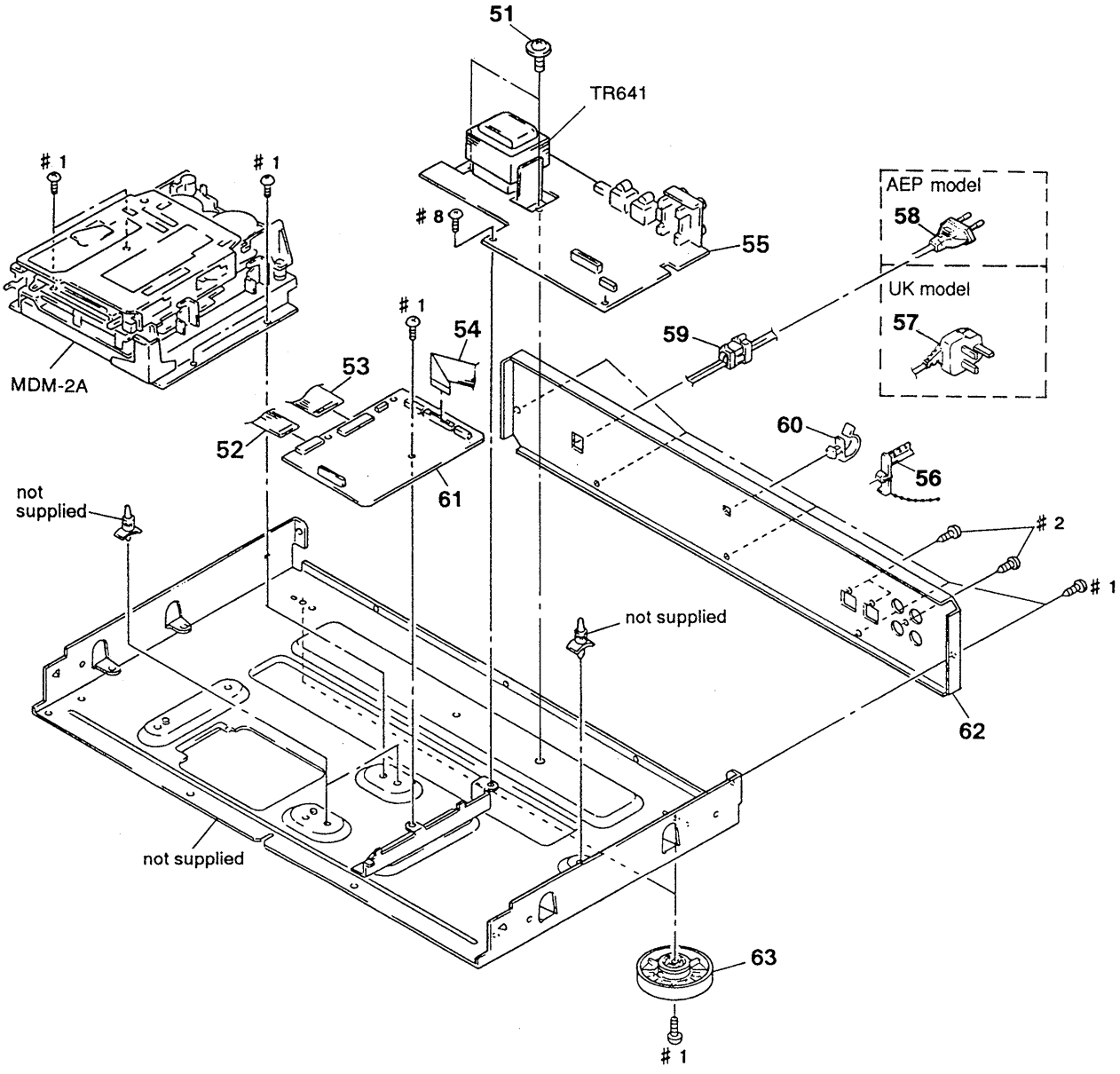
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

6-1. CASE AND FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	4-969-230-02	KNOB (REC)	
2	4-969-229-01	KNOB (AMS)	
3	A-2003-693-A	KNOB (DIA. 10) ASSY	
4	3-354-931-01	KNOB (DIA. 10)	
5	3-354-981-01	SPRING (SUS), RING	
6	4-922-518-01	KNOB (TIMER)	
* 7	1-654-135-11	POWER SWITCH BOARD	
8	4-951-620-01	SCREW (2.6X8), +BVTP	
9	4-969-215-01	SPRING, TORSION	
10	X-4945-242-1	BRACKET (LEVER LID) ASSY	
11	4-969-213-01	LEVER (LID)	
12	3-681-678-00	WASHER, SLIT	
* 13	1-654-134-11	HP BOARD	
* 14	4-954-926-41	CUSHION	
* 15	1-654-136-11	REC BOARD	
16	3-917-216-11	KNOB (TIMER)	
17	X-4946-339-2	PANEL ASSY, FRONT	
* 18	A-4673-746-A	DISPLAY BOARD, COMPLETE	
19	1-776-015-11	WIRE (FLAT TYPE) (22 CORE)	
20	3-704-366-01	SCREW (CASE) (M3X8)	
21	4-972-197-01	CASE	

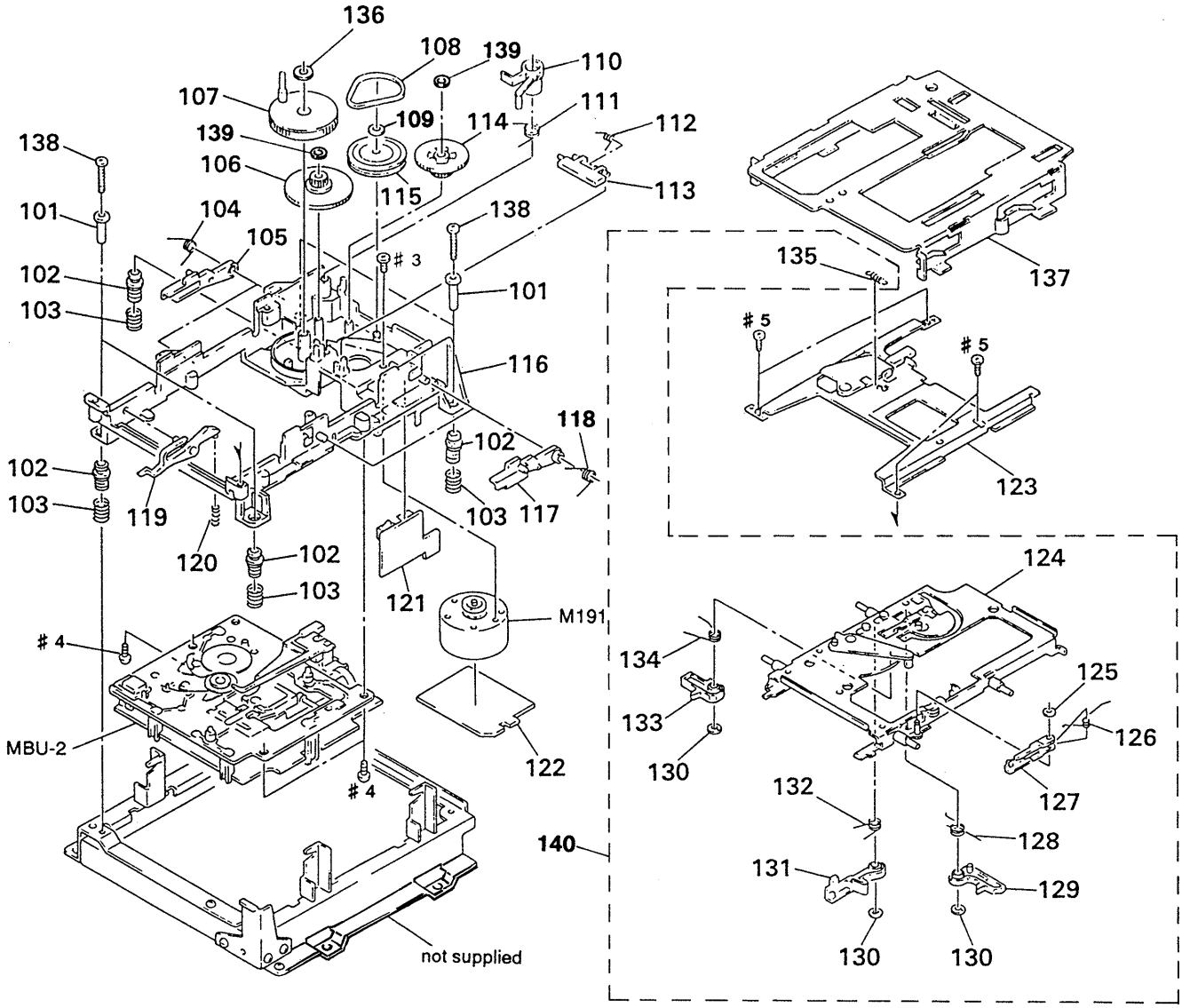
6-2. CHASSIS SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X8	
52	1-766-014-11	WIRE (FLAT TYPE) (18 CORE)	
53	1-766-013-11	WIRE (FLAT TYPE) (30 CORE)	
54	1-769-123-11	WIRE (FLAT TYPE) (22 CORE)	
* 55	A-4673-633-A	POWER BOARD, COMPLETE	
56	4-956-370-02	BAND, PLUG FIXED	
⚠57	1-696-586-21	CORD, POWER (UK)	
⚠58	1-575-651-91	CORD, POWER (AEP)	
* 59	3-703-244-00	BUSHING (2104), CORD	
* 60	4-949-235-01	HOOK (AEP)	
* 61	A-4673-635-A	DIGITAL BOARD, COMPLETE	
* 62	4-976-594-31	PANEL, BACK (AEP)	
* 62	4-976-594-41	PANEL, BACK (UK)	
63	4-956-885-11	FOOT (F58175S2W)	
⚠TR641	1-427-898-11	TRANSFORMER, POWER	

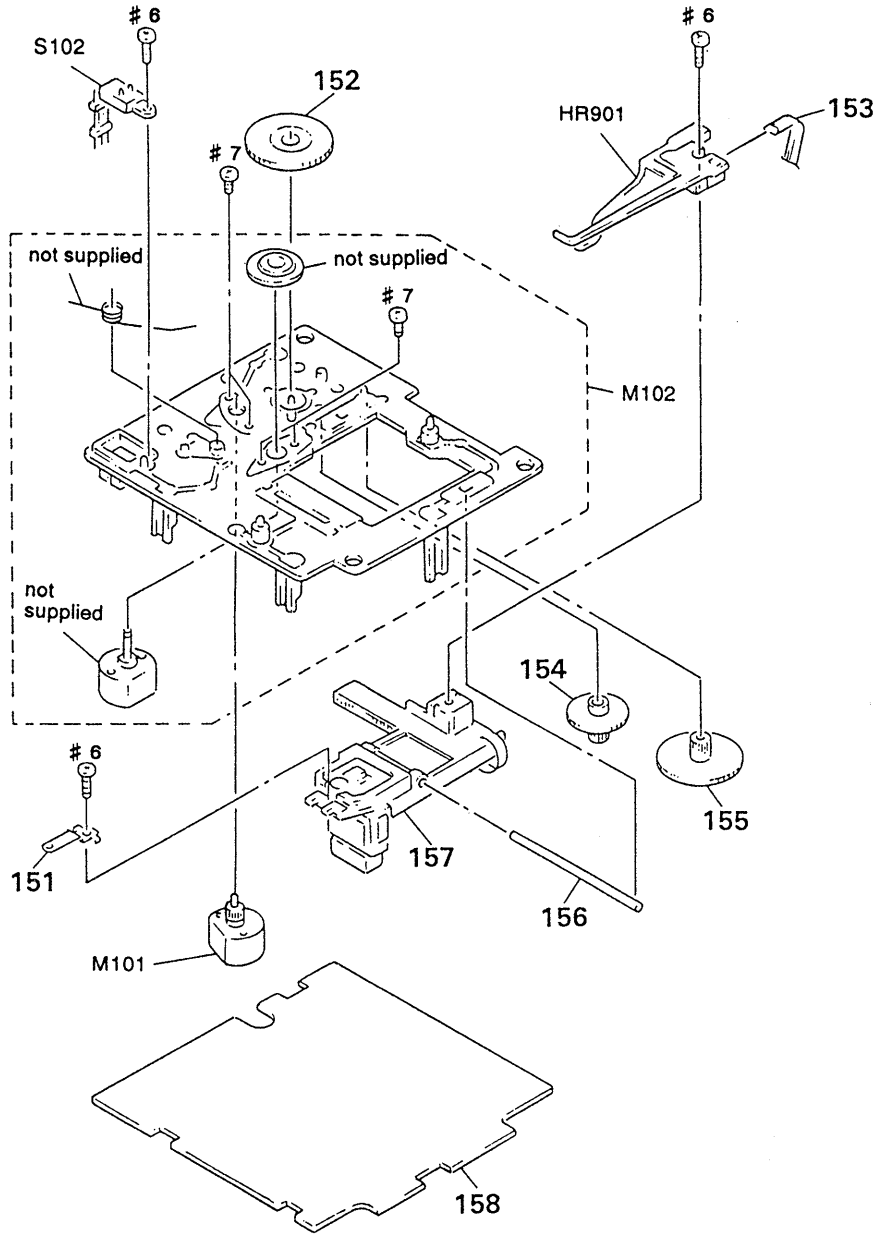
6-3. MECHANISM SECTION (MDM-2A)



Ref. No.	Part No.	Description	Remark
101	4-967-672-01	COLLAR (DAMPER)	
102	4-967-671-01	INSULATOR (MD)	
103	4-967-673-01	SPRING, COMPRESSION	
104	4-967-668-01	SPRING (UDL), TORSION	
105	4-967-667-01	LEVER (UDL)	
106	4-967-655-01	GEAR (BD-B)	
107	X-4945-069-1	CAM ASSY	
108	4-967-656-01	BELT (BD)	
109	4-968-919-31	WASHER, STOPPER	
110	4-967-637-01	LEVER (SLM)	
111	4-967-638-01	SPRING (SLM), TORSION	
112	4-968-273-01	SPRING (OWH), TORSION	
113	4-968-272-01	LEVER (OWH)	
114	4-967-654-01	GEAR (BD-A)	
115	4-957-794-01	PULLEY (GEAR 1)	
* 116	X-4945-068-1	BASE (BD) ASSY	
117	4-967-669-01	LEVER (UDR)	
118	4-967-670-01	SPRING (UDR), TORSION	
119	4-967-657-01	LEVER (DOOR)	
120	4-970-710-01	SPRING, COMPRESSION	
* 121	1-653-411-11	DETECTION SW BOARD	

Ref. No.	Part No.	Description	Remark
* 122	1-653-412-11	MOTOR BOARD	
123	A-4660-647-B	BRACKET (LVO) ASSY	
* 124	X-4946-378-1	HOLDER ASSY	
125	4-968-919-11	WASHER, STOPPER	
126	4-967-646-01	SPRING (SHT), TORSION	
127	4-967-645-01	LEVER (SHT)	
128	4-977-450-01	SPRING (LM), TORSION	
129	4-967-639-01	LEVER (LM)	
130	4-968-919-01	WASHER, STOPPER	
131	4-967-641-01	LEVER (L)	
132	4-967-642-01	SPRING (L), TORSION	
133	4-967-643-01	LEVER (LS)	
134	4-967-644-01	SPRING (LS), TORSION	
135	4-971-743-02	SPRING, TENSION	
136	4-968-919-21	WASHER, STOPPER	
* 137	X-4945-872-1	SLIDER (M) ASSY	
138	4-972-910-01	SCREW (2.6X18), +B	
139	4-968-919-41	WASHER, STOPPER	
140	A-4660-953-B	HOLDER COMPLETE ASSY BOARD, COMPLETE	
M191	A-4660-646-A	MOTOR ASSY (LOADING)	

6-4. BASE UNIT SECTION (MBU-2)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
151	4-967-679-01	SPRING (OP), LEAF	
152	4-967-675-01	GEAR (SL-A)	
153	1-654-446-11	OWH FLEXIBLE BOARD	
154	4-967-676-01	GEAR (SL-B)	
155	4-967-677-01	GEAR (SL-C)	
156	4-967-678-01	SHAFT (OP)	
⚠157	8-583-009-11	OPTICAL PICK-UP KMS-210A/J-N	
* 158	A-4673-174-A	BD BOARD, COMPLETE	
HR901	1-500-175-11	HEAD, OVER LIGHT (RF322-74A)	
M101	A-4660-651-A	MOTOR ASSY (SLED)	
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)	

BD

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description			Remark
*	A-4673-174-A	BD BOARD, COMPLETE **********			
		< CAPACITOR >			
C101	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C104	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C113	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C114	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C115	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C116	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C119	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C121	1-126-395-11	ELECT	22uF	20%	16V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C125	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C126	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C128	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C131	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C132	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C151	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C155	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V
C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C163	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C164	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C166	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C168	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C169	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C170	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C175	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C176	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C177	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C178	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C181	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C182	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C183	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C184	1-107-836-11	ELECT CHIP	22uF	20%	8V
C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C186	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C191	1-126-395-11	ELECT	22uF	20%	16V
C192	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C193	1-164-346-11	CERAMIC CHIP	1uF		16V
C194	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
		< CONNECTOR >			
CN101	1-766-508-11	CONNECTOR, FFC/FPC (ZIF) 22P			
CN102	1-766-510-21	CONNECTOR, FFC/FPC 30P			
CN103	1-766-509-21	CONNECTOR, FFC/FPC 18P			
CN104	1-766-898-21	HOUSING, CONNECTOR(PC BOARD) 4P			
		< DIODE >			
D101	8-719-988-62	DIODE 1SS355			
D155	8-719-031-17	DIODE 1SS322-TE85L			
D161	8-719-421-15	DIODE MA8027-L			
D181	8-719-033-60	DIODE F1P2STP			
D183	8-719-033-60	DIODE F1P2STP			
		< IC >			
IC101	8-752-072-68	IC CXA1981AR			
IC102	8-759-243-19	IC TC7SU04F			
IC121	8-752-375-06	IC CXD2535AR			

Ref. No.	Part No.	Description	Remark
IC122	8-759-243-19	IC TC7SU04F	
IC151	8-759-179-60	IC MPC17A38VMEL	
IC171	8-759-504-12	IC X24C01S	
IC172	8-759-149-73	IC uPC842G2	
IC181	8-759-095-65	IC TC74ACT540FS	
IC182	8-759-243-19	IC TC7SU04F	
IC191	8-759-822-99	IC L88MS05T-FA	
		< COIL >	
L101	1-414-234-11	INDUCTOR, FERRITE BEAD	
L102	1-414-234-11	INDUCTOR, FERRITE BEAD	
L103	1-414-234-11	INDUCTOR, FERRITE BEAD	
L105	1-414-234-11	INDUCTOR, FERRITE BEAD	
L106	1-414-234-11	INDUCTOR, FERRITE BEAD	
L110	1-216-295-91	CONDUCTOR, CHIP	
L121	1-414-234-11	INDUCTOR, FERRITE BEAD	
L122	1-412-039-51	INDUCTOR CHIP 100uH	
L151	1-412-622-51	INDUCTOR 10uH	
L152	1-412-622-51	INDUCTOR 10uH	
L153	1-412-039-51	INDUCTOR CHIP 100uH	
L154	1-412-039-51	INDUCTOR CHIP 100uH	
L155	1-410-980-51	INDUCTOR CHIP 1mH	
L161	1-414-234-11	INDUCTOR, FERRITE BEAD	
L162	1-414-234-11	INDUCTOR, FERRITE BEAD	
L195	1-233-316-21	FILTER, CHIP EMI	
		< TRANSISTOR >	
Q101	8-729-905-12	TRANSISTOR DTA144EU	
Q151	8-729-905-18	TRANSISTOR DTC144EU	
Q162	8-729-101-07	TRANSISTOR 2SB798-DL	
Q163	8-729-905-12	TRANSISTOR DTA144EU	
Q164	8-729-924-19	TRANSISTOR DTA123JU	
Q181	8-729-018-75	TRANSISTOR 2SJ278MY	
Q182	8-729-017-65	TRANSISTOR 2SK1764KY	
		< RESISTOR >	
R101	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R102	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R103	1-208-806-11	METAL CHIP 10K 0.50% 1/10W	
R104	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R105	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R106	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R107	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R114	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R116	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R117	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R120	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R121	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R122	1-216-295-91	CONDUCTOR, CHIP	
R123	1-216-037-00	METAL CHIP 330 5% 1/10W	
R124	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R125	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R128	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R129	1-216-037-00	METAL CHIP 330 5% 1/10W	
R130	1-216-041-00	METAL CHIP 470 5% 1/10W	
R131	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R132	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R133	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R134	1-216-037-00	METAL CHIP 330 5% 1/10W	
R135	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R136	1-216-041-00	METAL CHIP 470 5% 1/10W	
R137	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R139	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R140	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R142	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R143	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R144	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R145	1-216-121-91	METAL GLAZE 1M 5% 1/10W	
R146	1-216-037-00	METAL CHIP 330 5% 1/10W	
R147	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R148	1-216-045-00	METAL CHIP 680 5% 1/10W	
R151	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R152	1-216-295-91	CONDUCTOR, CHIP	
R153	1-216-295-91	CONDUCTOR, CHIP	
R154	1-220-259-11	METAL GLAZE 150 5% 1/4W	
R155	1-220-259-11	METAL GLAZE 150 5% 1/4W	
R161	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R162	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R163	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R164	1-216-045-00	METAL CHIP 680 5% 1/10W	
R165	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R166	1-220-250-11	METAL GLAZE 10 5% 1/2W	
R167	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R168	1-218-236-91	METAL GLAZE 1 10% 1/4W	
R170	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R171	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R172	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R174	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R176	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R178	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R181	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R182	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R183	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R184	1-216-296-91	CONDUCTOR, CHIP	
R186	1-216-296-91	CONDUCTOR, CHIP	
R195	1-216-295-91	CONDUCTOR, CHIP	
		< VARIABLE RESISTOR >	
RV101	1-241-397-11	RES, ADJ, METAL GLAZE 47K	
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K	

BD DETECTION SW DIGITAL

Ref.No.	Part No.	Description			Remark
RV105	1-241-395-11	RES, ADJ, METAL GLAZE 10K			
		< SWITCH >			
S101	1-572-467-31	SWITCH, PUSH (1 KEY) (LIMIT SW)			
**********					
*	1-653-411-11	DETECTION SW BOARD			
		**********			
		< CONNECTOR >			
CN193	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P			
		< SWITCH >			
S191	1-762-149-11	SWITCH, PUSH (1 KEY) (LOAD OUT DET SWITCH)			
S192	1-762-149-11	SWITCH, PUSH (1 KEY) (LOAD IN DET SWITCH)			
S193	1-762-149-11	SWITCH, PUSH (1 KEY) (CHACKING IN DET SWITCH)			
**********					
*	A-4673-635-A	DIGITAL BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C202	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C203	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C204	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C206	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C207	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C209	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C212	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C213	1-126-395-11	ELECT	22uF	20%	16V
C214	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C216	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C274	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C275	1-163-091-00	CERAMIC CHIP	8PF		50V
C276	1-163-091-00	CERAMIC CHIP	8PF		50V
C277	1-216-295-91	CONDUCTOR, CHIP			
C280	1-126-204-11	ELECT	47uF	20%	16V
C281	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C282	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C283	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C284	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C285	1-126-204-11	ELEC CHIP	47uF	20%	16V
C286	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C288	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C301	1-126-395-11	ELECT	22uF	20%	16V
C302	1-126-395-11	ELECT	22uF	20%	16V
C303	1-126-204-11	ELECT	47uF	20%	16V
C304	1-126-204-11	ELECT	47uF	20%	16V
C305	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C306	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C307	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C308	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C309	1-126-395-11	ELECT	22uF	20%	16V
C310	1-126-395-11	ELECT	22uF	20%	16V
C311	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C312	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C313	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C314	1-126-204-11	ELECT	47uF	20%	16V
C315	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C316	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C317	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C318	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C319	1-126-204-11	ELECT	47uF	20%	16V
C320	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C321	1-126-204-11	ELECT	47uF	20%	16V
C322	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C323	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C326	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C327	1-126-204-11	ELECT CHIP	47uF	20%	16V
C331	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C333	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C334	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C341	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C342	1-126-204-11	ELECT CHIP	47uF	20%	16V
C343	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C344	1-126-204-11	ELECT CHIP	47uF	20%	16V
C346	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C348	1-163-038-91	CERAMIC	0.1uF		25V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C352	1-126-204-11	ELECT CHIP	47uF	20%	16V
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C354	1-126-204-11	ELECT CHIP	47uF	20%	16V
C355	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C356	1-126-204-11	ELECT CHIP	47uF	20%	16V
C357	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C361	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C362	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C363	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C364	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C365	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C366	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C367	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C368	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C411	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C412	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C413	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V

Ref. No.	Part No.	Description			Remark
C415	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C416	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C417	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C418	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C419	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C420	1-126-204-11	ELECT	47uF	20%	16V
C421	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C422	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C423	1-163-038-91	CERAMIC	0.1uF		25V
C431	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C473	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN201	1-774-287-11	CONNECTOR (FFC) 22P			
CN202	1-774-031-21	CONNECTOR, FFC/FPC 30P			
CN221	1-774-030-21	CONNECTOR, FFC/FPC 18P			
* CN222	1-770-154-11	PIN, CONNECTOR (PC BOARD) 6P			
CN223	1-774-287-11	CONNECTOR (FFC) 22P			
* CN251	1-770-154-11	PIN, CONNECTOR (PC BOARD) 6P			
* CN281	1-770-153-11	PIN, CONNECTOR (PC BOARD) 8P			
		< DIODE >			
D301	8-719-914-42	DIODE DA204K-T-146			
D302	8-719-914-42	DIODE DA204K-T-146			
D303	1-216-295-91	CONDUCTOR, CHIP			
D341	8-719-056-15	DIODE F01J4L			
D411	8-719-974-98	DIODE HVM17-01			
		< FERRITE BEAD >			
FB271	1-216-295-91	CONDUCTOR, CHIP			
FB272	1-414-235-11	INDUCTOR, FERRITE BEAD			
FB273	1-216-295-91	CONDUCTOR, CHIP			
FB341	1-414-235-11	INDUCTOR, FERRITE BEAD			
FB411	1-414-235-11	INDUCTOR, FERRITE BEAD			
FB471	1-216-295-91	CONDUCTOR, CHIP			
		< IC >			
IC201	8-759-359-97	IC M37610MD-059FP			
IC271	8-752-371-17	IC CXD2536R			
IC272	8-759-329-31	IC MSM514400CSJADR1-K			
IC301	8-759-352-64	IC CXD8566M-T6			
IC302	8-759-352-60	IC CXA8054M-T6			
IC341	8-759-352-62	IC CXD8567M-T6			
IC342	8-759-981-48	IC TL082M			
IC411	8-759-158-96	IC TC9246F-TP1			
IC412	8-759-242-70	IC TC7WU04F			
IC431	8-759-040-83	IC BA6287F			
		< COIL >			
L221	1-216-295-91	CONDUCTOR, CHIP			
L341	1-216-295-91	CONDUCTOR, CHIP			
L344	1-216-295-91	CONDUCTOR, CHIP			
L411	1-412-332-41	INDUCTOR	2.2uH		
L412	1-414-386-11	INDUCTOR, FERRITE BEAD			
		< RESISTOR >			
R203	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R204	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R205	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R206	1-216-073-00	METAL CHIP	10K	5%	1/10W
R207	1-216-073-00	METAL CHIP	10K	5%	1/10W
R208	1-216-073-00	METAL CHIP	10K	5%	1/10W
R209	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R211	1-216-073-00	METAL CHIP	10K	5%	1/10W
R213	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R214	1-216-295-91	CONDUCTOR, CHIP			
R215	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R216	1-216-073-00	METAL CHIP	10K	5%	1/10W
R217	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R218	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R219	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R220	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R221	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R222	1-216-073-00	METAL CHIP	10K	5%	1/10W
R223	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R224	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R225	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R226	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R227	1-216-073-00	METAL CHIP	10K	5%	1/10W
R228	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R229	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R230	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R231	1-216-073-00	METAL CHIP	10K	5%	1/10W
R232	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R233	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R234	1-216-073-00	METAL CHIP	10K	5%	1/10W
R235	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R236	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R237	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R238	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R239	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R240	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R241	1-216-073-00	METAL CHIP	10K	5%	1/10W
R242	1-216-073-00	METAL CHIP	10K	5%	1/10W
R243	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R244	1-216-073-00	METAL CHIP	10K	5%	1/10W
R245	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R246	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R247	1-216-073-00	METAL CHIP	10K	5%	1/10W
R248	1-216-073-00	METAL CHIP	10K	5%	1/10W
R249	1-216-073-00	METAL CHIP	10K	5%	1/10W

DIGITAL DISPLAY

Ref.No.	Part No.	Description				Remark
R250	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R251	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R252	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R253	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R254	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R255	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R256	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R257	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R258	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R259	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R271	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R272	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R273	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R274	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R275	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R276	1-216-037-00	METAL CHIP	330	5%	1/10W	
R277	1-216-033-00	METAL CHIP	220	5%	1/10W	
R278	1-216-033-00	METAL CHIP	220	5%	1/10W	
R279	1-216-295-91	CONDUCTOR, CHIP				
R280	1-216-295-91	CONDUCTOR, CHIP				
R281	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R282	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R283	1-216-033-00	METAL CHIP	220	5%	1/10W	
R284	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W	
R301	1-208-806-11	METAL CHIP	10K	0.5%	1/10W	
R302	1-208-806-11	METAL CHIP	10K	0.5%	1/10W	
R303	1-208-814-11	METAL CHIP	22K	0.5%	1/10W	
R304	1-208-814-11	METAL CHIP	22K	0.5%	1/10W	
R305	1-216-017-91	METAL GLAZE	47	5%	1/10W	
R306	1-216-017-91	METAL GLAZE	47	5%	1/10W	
R307	1-216-017-91	METAL GLAZE	47	5%	1/10W	
R308	1-216-033-00	METAL CHIP	220	5%	1/10W	
R310	1-216-295-91	CONDUCTOR, CHIP				
R313	1-216-295-91	CONDUCTOR, CHIP				
R316	1-216-295-91	CONDUCTOR, CHIP				
R341	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R343	1-216-295-91	CONDUCTOR, CHIP				
R361	1-216-687-11	METAL CHIP	33K	0.5%	1/10W	
R362	1-216-687-11	METAL CHIP	33K	0.5%	1/10W	
R363	1-208-814-11	METAL CHIP	22K	0.5%	1/10W	
R364	1-208-814-11	METAL CHIP	22K	0.5%	1/10W	
R365	1-216-687-11	METAL CHIP	33K	0.5%	1/10W	
R366	1-216-687-11	METAL CHIP	33K	0.5%	1/10W	
R367	1-208-814-11	METAL CHIP	22K	0.5%	1/10W	
R368	1-208-814-11	METAL CHIP	22K	0.5%	1/10W	
R369	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R370	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R371	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R372	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R401	1-414-386-11	INDUCTOR, FERRITE BEAD				

Ref.No.	Part No.	Description				Remark
R402	1-414-386-11	INDUCTOR, FERRITE BEAD				
R411	1-208-810-11	METAL CHIP	15K	0.50%	1/10W	
R412	1-208-810-11	METAL CHIP	15K	0.50%	1/10W	
R413	1-208-810-11	METAL CHIP	15K	0.50%	1/10W	
R414	1-208-810-11	METAL CHIP	15K	0.50%	1/10W	
R415	1-216-651-11	METAL CHIP	1K	0.5%	1/10W	
R416	1-216-651-11	METAL CHIP	1K	0.5%	1/10W	
R417	1-216-121-91	METAL GLAZE	1M	5%	1/10W	
R418	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R431	1-216-021-00	METAL CHIP	68	5%	1/10W	
R432	1-216-021-00	METAL CHIP	68	5%	1/10W	
R451	1-216-295-91	CONDUCTOR, CHIP				
R461	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R463	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
		< VIBRATOR >				
X201	1-760-493-11	VIBRATOR, CERAMIC (CHIP TYPE) (8MHz)				
X203	1-760-841-11	VIBRATOR, CRYSTAL (45MHz)				
**********						
*	A-4673-746-A	DISPLAY BOARD, COMPLETE				
		**********				
	2-389-320-01	CUSHION				
*	4-956-134-01	HOLDER (FL TUBE)				
		< CAPACITOR >				
C705	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C706	1-162-290-31	CERAMIC	470PF	10%	50V	
C707	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C708	1-161-494-00	CERAMIC	0.022uF		25V	
C709	1-124-234-00	ELECT	22uF	20%	16V	
C710	1-162-282-31	CERAMIC	100PF	10%	50V	
C711	1-164-159-11	CERAMIC	0.1uF		50V	
C720	1-164-159-11	CERAMIC	0.1uF		50V	
C721	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C731	1-162-292-31	CERAMIC	680PF	10%	50V	
C732	1-162-292-31	CERAMIC	680PF	10%	50V	
C751	1-162-292-31	CERAMIC	680PF	10%	50V	
C752	1-162-292-31	CERAMIC	680PF	10%	50V	
		< CONNECTOR >				
CN701	1-774-288-11	CONNECTOR, FFC 22P				
CN741	1-766-200-11	SOCKET, CONNECTOR PIN 5P				
CN751	1-766-806-11	HOUSING, CONNECTOR 3P				
		< FLUORESCENT INDICATOR >				
FL701	1-517-353-11	INDICATOR TUBE, FLUORESCENT				

Ref.No.	Part No.	Description			Remark
		< IC >			
IC701	8-759-297-23	IC M66004M8FP			
IC702	8-741-810-59	IC ELEMENT, RAY-CATCHER SBX1810-59			
		< RESISTOR >			
R705	1-249-435-11	CARBON	33K	5%	1/4W
R708	1-249-429-11	CARBON	10K	5%	1/4W
R709	1-249-429-11	CARBON	10K	5%	1/4W
R721	1-247-807-31	CARBON	100	5%	1/4W
R722	1-247-807-31	CARBON	100	5%	1/4W
R723	1-247-807-31	CARBON	100	5%	1/4W
R724	1-247-807-31	CARBON	100	5%	1/4W
R741	1-249-429-11	CARBON	10K	5%	1/4W
R752	1-249-421-11	CARBON	2.2K	5%	1/4W
R753	1-249-423-11	CARBON	3.3K	5%	1/4W
R754	1-249-425-11	CARBON	4.7K	5%	1/4W
R755	1-249-429-11	CARBON	10K	5%	1/4W
R756	1-249-435-11	CARBON	33K	5%	1/4W
R762	1-249-421-11	CARBON	2.2K	5%	1/4W
R763	1-249-423-11	CARBON	3.3K	5%	1/4W
R772	1-249-421-11	CARBON	2.2K	5%	1/4W
R773	1-249-423-11	CARBON	3.3K	5%	1/4W
R774	1-249-425-11	CARBON	4.7K	5%	1/4W
R775	1-249-429-11	CARBON	10K	5%	1/4W
R776	1-249-435-11	CARBON	33K	5%	1/4W
R791	1-247-807-31	CARBON	100	5%	1/4W
		< SWITCH >			
S701	1-467-891-11	ENCODER, ROTARY (⏮ AMS ⏭, PUSH ENTER)			
S751	1-554-303-21	SWITCH, TACTILE (EDIT NO)			
S752	1-554-303-21	SWITCH, TACTILE (YES)			
S753	1-554-303-21	SWITCH, TACTILE (⏸)			
S754	1-554-303-21	SWITCH, TACTILE (▷)			
S756	1-554-303-21	SWITCH, TACTILE (DISPLAY)			
S761	1-554-303-21	SWITCH, TACTILE (PLAY MODE)			
S762	1-554-303-21	SWITCH, TACTILE (REPEAT)			
S763	1-554-303-21	SWITCH, TACTILE (SCROLL)			
S771	1-554-303-21	SWITCH, TACTILE (● REC)			
S772	1-554-303-21	SWITCH, TACTILE (■)			
S774	1-554-303-21	SWITCH, TACTILE (⏭)			
S775	1-554-303-21	SWITCH, TACTILE (⏮)			
S776	1-554-303-21	SWITCH, TACTILE (⏏ EJECT)			

Ref.No.	Part No.	Description			Remark
*	1-654-134-11	HP BOARD			
		********			
		< CAPACITOR >			
C701	1-162-294-31	CERAMIC	0.001uF	10%	50V
C702	1-162-294-31	CERAMIC	0.001uF	10%	50V
C703	1-162-294-31	CERAMIC	0.001uF	10%	50V
C704	1-162-294-31	CERAMIC	0.001uF	10%	50V
		< JACK >			
J701	1-770-306-11	JACK, LARGE TYPE (PHONES)			
		< COIL >			
L701	1-412-473-21	INDUCTOR	0uH		
L702	1-412-473-21	INDUCTOR	0uH		
		< RESISTOR >			
R713	1-249-393-11	CARBON	10	5%	1/4W
R714	1-249-393-11	CARBON	10	5%	1/4W
		< VARIABLE RESISTOR >			
RV701	1-223-752-11	RES, VAR, CARBON 1K/1K (LEVEL)			
*	1-653-412-11	MOTOR BOARD			
		**********			
		< CAPACITOR >			
C199	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN191	1-568-944-11	PIN, CONNECTOR 6P			
CN192	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P			
	1-654-446-11	OWH FLEXIBLE BOARD			
		**********			
*	A-4673-633-A	POWER BOARD, COMPLETE			
		**********			
*	1-535-303-00	WIRE, JUMPER			
	7-682-548-09	SCREW +BVTT 3X8 (S)			
*	4-962-200-01	PLATE (TR), GROUND			
		< CAPACITOR >			
C501	1-104-665-11	ELECT	100uF	20%	16V
C502	1-104-665-11	ELECT	100uF	20%	16V

POWER

Ref. No.	Part No.	Description			Remark
C503	1-124-572-11	ELECT	100uF	20%	63V
C504	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C505	1-115-162-21	ELECT	22000uF	20%	16V
C506	1-126-937-11	ELECT	4700uF	20%	16V
C507	1-126-965-11	ELECT	22uF	20%	50V
C508	1-126-950-11	ELECT	330uF	20%	35V
C509	1-163-038-91	CERAMIC	0.1uF		25V
C511	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C512	1-124-903-11	ELECT	1uF	20%	50V
C513	1-124-443-00	ELECT	100uF	20%	10V
C514	1-104-665-11	ELECT	100uF	20%	16V
C515	1-126-941-11	ELECT	470uF	20%	16V
C521	1-124-907-11	ELECT	10uF	20%	50V
C522	1-124-907-11	ELECT	10uF	20%	50V
C524	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C532	1-110-489-11	CAP, DOUBLE LAYER	1.0F		
C533	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C534	1-124-443-00	ELECT	100uF	20%	10V
C535	1-124-903-11	ELECT	1uF	20%	50V
C542	1-124-443-00	ELECT	100uF	20%	10V
C543	1-124-443-00	ELECT	100uF	20%	10V
C545	1-104-665-11	ELECT	100uF	20%	16V
C570	1-124-477-11	ELECT	47uF	20%	25V
C571	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C572	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C573	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C574	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C575	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C576	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C577	1-124-910-11	ELECT	47uF	20%	50V
C578	1-124-910-11	ELECT	47uF	20%	50V
C579	1-163-009-11	CERAMIC CHIP	1000PF	10%	50V
C580	1-163-009-11	CERAMIC CHIP	1000PF	10%	50V
C591	1-104-665-11	ELECT	100uF	20%	16V
C592	1-104-665-11	ELECT	100uF	20%	16V
C593	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C594	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C611	1-163-009-11	CERAMIC CHIP	1000PF	10%	50V
C612	1-163-009-11	CERAMIC CHIP	1000PF	10%	50V
C621	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C622	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C623	1-104-664-11	ELECT	47uF	20%	10V
C624	1-104-664-11	ELECT	47uF	20%	10V
C625	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C626	1-163-038-91	CERAMIC CHIP	0.1uF		25V
⚠C641	1-161-742-00	CERAMIC	0.0022uF	20%	400V
⚠C642	1-161-742-00	CERAMIC	0.0022uF	20%	400V
⚠C643	1-161-742-00	CERAMIC	0.0022uF	20%	400V
⚠C644	1-161-742-00	CERAMIC	2200PF	20%	400V
⚠C645	1-162-599-12	CERAMIC	0.0047uF		400V
C671	1-124-910-11	ELECT	47uF	20%	50V
C672	1-124-910-11	ELECT	47uF	20%	50V
C673	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C674	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C675	1-124-910-11	ELECT	47uF	20%	50V
C676	1-124-910-11	ELECT	47uF	20%	50V

< CONNECTOR >

CN501	1-770-650-11	CONNECTOR, FFC/FPC 22P	
CN591	1-506-468-11	PIN, CONNECTOR 3P	
* CN611	1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P	
* CN641	1-580-230-21	PIN, CONNECTOR (PC BOARD) 2P	

< DIODE >

D501	8-719-200-02	DIODE	10E2
D502	8-719-200-02	DIODE	10E2
D503	8-719-200-02	DIODE	10E2
D504	8-719-200-02	DIODE	10E2
D505	8-719-200-02	DIODE	10E2
D506	8-719-017-58	DIODE	MA8068
D507	8-719-801-78	DIODE	1SS184
D508	8-719-422-43	DIODE	MA8051-H
D521	8-719-801-78	DIODE	1SS184
D523	8-719-016-74	DIODE	1SS352
D532	8-719-056-15	DIODE	F01J4L
D533	8-719-056-15	DIODE	F01J4L
D536	8-719-016-74	DIODE	1SS352
D537	8-719-016-74	DIODE	1SS352
D581	8-719-820-05	DIODE	1SS181
D582	8-719-016-74	DIODE	1SS352

< IC >

IC501	8-759-633-42	IC	M5293L
IC511	8-759-274-37	IC	BA3963
IC521	8-759-233-64	IC	TC74HCU04AF
IC531	8-759-327-15	IC	M62005L
IC541	8-759-290-19	IC	BA3960
IC571	8-759-636-55	IC	M5218AFP
IC591	8-759-636-55	IC	M5218AFP
IC621	8-749-921-12	IC	GP1F32T
IC622	8-749-011-65	IC	GP1F32RX
IC623	8-759-243-19	IC	TC7SU04F
IC671	8-759-636-55	IC	M5218AFP

< JACK >

J581	1-573-520-11	JACK, PIN 4P (LINE IN/OUT)

< COIL >

L621	1-414-233-21	BEAD, FERRITE (CHIP)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No.	Part No.	Description				Remark
L623	1-410-389-31	INDUCTOR CHIP	47uH			
		< LINE FILTER >				
⚠LF641	1-411-547-11	COIL, LINE FILTER				
		< TRANSISTOR >				
Q581	8-729-901-46	TRANSISTOR	DTA114YK			
Q583	8-729-023-22	TRANSISTOR	2SD2114K			
Q584	8-729-023-22	TRANSISTOR	2SD2114K			
		< RESISTOR >				
R501	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R502	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R503	1-216-037-00	METAL CHIP	330	5%	1/10W	
R504	1-216-037-00	METAL CHIP	330	5%	1/10W	
R506	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R507	1-216-037-00	METAL CHIP	330	5%	1/10W	
R508	1-216-037-00	METAL CHIP	330	5%	1/10W	
R521	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R522	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R523	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R524	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R525	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R526	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R533	1-216-170-00	METAL GLAZE	68	5%	1/8W	
R534	1-216-170-00	METAL GLAZE	68	5%	1/8W	
R541	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R542	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R543	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R544	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R571	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R572	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R573	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R574	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R575	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R576	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R577	1-216-647-11	METAL CHIP	680	0.5%	1/10W	
R578	1-216-647-11	METAL CHIP	680	0.5%	1/10W	
R579	1-216-639-11	METAL CHIP	330	0.5%	1/10W	
R580	1-216-639-11	METAL CHIP	330	0.5%	1/10W	
R582	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R583	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R584	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R591	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R592	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R593	1-216-037-00	METAL CHIP	330	5%	1/10W	
R594	1-216-037-00	METAL CHIP	330	5%	1/10W	
R603	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R604	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R605	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R606	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R611	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R612	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R616	1-216-295-91	CONDUCTOR, CHIP				
R621	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R622	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R634	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R671	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R672	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R675	1-216-105-91	METAL CHIP	220K	5%	1/10W	
R676	1-216-105-91	METAL CHIP	220K	5%	1/10W	
**********						
*	1-654-135-11	POWER SW BOARD				
		**********				
		< CONNECTOR >				
CN742	1-766-203-11	PLUG, CONNECTOR PIN(PC BOARD)	5P			
		< DIODE >				
D701	8-719-313-40	LED	SML1516W (ON/STANDBY)			
		< TRANSISTOR >				
Q701	8-729-900-61	TRANSISTOR	DTA114ES			
		< RESISTOR >				
R701	1-249-429-11	CARBON	10K	5%	1/4W	
R702	1-249-429-11	CARBON	10K	5%	1/4W	
R711	1-249-411-11	CARBON	330	5%	1/4W	
R712	1-249-415-11	CARBON	680	5%	1/4W	
R764	1-249-425-11	CARBON	4.7K	5%	1/4W	
		< SWITCH >				
S703	1-762-234-11	SWITCH, SLIDE (TIMER)				
S764	1-554-303-21	SWITCH, TACTILE (POWER)				
**********						
*	1-654-136-11	REC BOARD				
		*********				
		< CONNECTOR >				
CN752	1-766-805-11	CONNECTOR, BOARD TO BOARD	3P			
		< RESISTOR >				
R706	1-249-417-11	CARBON	1K	5%	1/4W	
R707	1-249-429-11	CARBON	10K	5%	1/4W	

REC

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV702	1-223-762-11	RES, VAR, CARBON 20K/20K (REC LEVEL)	
		< SWITCH >	
S702	1-572-624-11	SWITCH, SLIDE (INPUT)	
**********			
		MISCELLANEOUS	
		**********	
19	1-776-015-11	WIRE (FLAT TYPE) (22 CORE)	
52	1-766-014-11	WIRE (FLAT TYPE) (18 CORE)	
53	1-766-013-11	WIRE (FLAT TYPE) (30 CORE)	
54	1-769-123-11	WIRE (FLAT TYPE) (22 CORE)	
⚠57	1-696-586-21	CORD, POWER (UK)	
⚠58	1-575-651-91	CORD, POWER (AEP)	
153	1-654-446-11	OWH FLEXIBLE BOARD	
⚠157	8-583-009-11	OPTICAL PICK-UP KMS-210A/J-N	
HR901	1-500-175-11	HEAD, OVER LIGHT (RF322-74A)	
M101	A-4660-651-A	MOTOR ASSY (SLED)	
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
M191	A-4660-646-A	MOTOR ASSY (LOADING)	
S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)	
⚠TR641	1-427-898-11	TRANSFORMER, POWER	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-473-405-11	REMOTE COMMANDER (RM-D4M)	
	1-558-271-11	CORD, CONNECTION (AUDIO 108cm)	
	1-574-264-11	CORD, LIGHT PLUG	
	3-707-584-21	COVER, BATTERY (for RM-D4M)	
	3-800-827-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE)	
	3-800-827-31	MANUAL, INSTRUCTION (CHINESE)	
	3-800-827-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (AEP)	
*	4-972-233-41	INDIVIDUAL CARTON (AEP)	
*	4-976-217-11	INDIVIDUAL CARTON (UK)	
*	4-978-112-01	CUSHION	
	4-978-497-01	LABEL (SL)	
**********			

Ref. No.	Part No.	Description	Remark
		**********	
		HARDWARE LIST	
		**********	
#1	7-682-548-09	SCREW +BVTT 3X8 (S)	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#3	7-621-775-20	SCREW +B 2.6X5	
#4	7-685-645-79	SCREW +BVTP 3X6 TYPE2 N-S	
#5	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT	
#6	7-685-105-19	TPG +P 2X8, TYPE 2, NON-SLIT	
#7	7-627-852-08	SCREW, PRECISION +P 1.7X2.5	
#8	7-685-871-01	SCREW +BVTT 3X6 (S)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-960-354-11

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
9510975555-1
Printed in Germany
© 1995. 9
Published by Home A&V Products Div.
Quality Engineering Dept.

MDS-303

SONY

SERVICE MANUAL

AEP Model
UK Model

SUPPLEMENT-1

File this supplement with the service manual.

Subject : 1. Correction
2. Parts changed
3. Service note
4. Change of the adjustment specification.
5. Addition to the countermeasure board.
6. Board change.

(ECN-CD501076)

1. Correction

• Correct your service manual as shown below.

TEST MODE

3-5. Functions of Other keys

Page	INCORRECT	CORRECT
23	▷/□□ Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.	▷ Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.

EXPLODED VIEW

Page	INCORRECT				CORRECT			
	Ref. No	Part No	Description	Remark	Ref. No	Part No	Description	Remark
68	* 13	1-654-134-11	HP BOARD		* 13	1-654-136-11	HP BOARD	
	* 15	1-654-136-11	REC BOARD		* 15	1-654-134-11	REC BOARD	
69	⚠58	1-575-651-91	CORD, POWER (AEP)		⚠58	1-575-651-21	CORD, POWER (AEP)	

2. Parts Changed

• Revise your service manual as shown below due to parts supply classification has been changed.

Page	FORMER				NEW			
	Ref. No	Part No	Description	Remark	Ref. No	Part No	Description	Remark
69	52	1-766-014-11	WIRE (FLAT TYPE) (18 CORE) (70 mm)		52	1-776-417-11	WIRE (FLAT TYPE) (18 CORE) (100 mm)	
	53	1-766-013-11	WIRE (FLAT TYPE) (30 CORE) (70 mm)		53	1-776-416-11	WIRE (FLAT TYPE) (30 CORE) (100 mm)	

3. Service note

[Note for replacement of IC121 and IC171 on the BD board]

IC121 on the BD board of this unit has modified from CXD2535AR to CXD2535BR due to an improvement.
Some contents of nonvolatile memory in the IC171 are modified according to this modification. When replacing IC171, the previous contents for IC121 (CXD2535AR) are written as an initialized value from the system control IC. (When replacing IC171, turn the power on once to write an initialized value.)
In case the IC171 on the BD board is replaced, which uses CXD2535BR to IC121, see the following procedure to rewrite the contents of nonvolatile memory. As for replacement of IC121, use CXD2535BR to rewrite the contents of IC171.

Table Comparison between CXD2535AR and CXD2535BR regarding the contents of nonvolatile memory

ADDRESS	CXD2535AR	CXD2535BR
15	90	93
2D	33	1A
2E	33	1A

- **How to rewrite the nonvolatile memory**

① Plug in the power plug to an outlet pressing the AMS knob, and release the AMS knob.
② Turn the AMS knob to be displayed "EEP MODE".
If the YES button is pressed, the display will be changed to "EEP ** @@".
(** : Address, @@ : data)
③ Turn the AMS knob to be displayed "EEP 15 @@".
④ If the AMS knob is pressed, "EEP 15 @@ > @@" will be displayed. So turn the AMS knob to be displayed "EEP 15 @@ > 93".
⑤ Pressing the YES button, "Complete!" is displayed once, "EEP 15 93" is displayed, and the data is rewritten.
⑥ As for the address 2D and 2E, rewrite each of them to "1A" following the steps ③ to ⑤ as well.
⑦ After the all modification are complete, press the NO button to be displayed "EEP MODE".
⑧ Press the REPEAT button. In case a disc is unloaded, the display "STANDBY" will be go on and off, then unplug the power plug. In case a disc is loaded, "STANDBY" is displayed once and the disc is ejected. After that, unplug the power plug from an outlet to be out from the EEP rewriting mode. (Refer to **[How to stop test mode]** as below.)
Note : The modification in the contents of nonvolatile memory is not reflected if the power is not turned off once.

[How to stop test mode]

In the previous mentioned text regarding test mode, "Exiting the test mode" is that should be unplug the power plug from an outlet. If the test mode is released in this way, an incorrect operation will rarely occur to the set. So release the test mode according to the followings.

(1) Press the REPEAT button.
(2) In case a disc is unloaded, the display "STANDBY" will go on and off.
In case a disc is loaded, the "STANDBY" is displayed once and the disc is ejected.
(3) Unplug the power plug from an outlet.

4. Change of the adjustment specifications.

The specification of the previous issued **"Service manual SECTION 4. ELECTRICAL ADJUSTMENT"** has been changed as below.

2-5. Temperature Compensation Offset Adjustment

Page	CURRENT	REVISED
6	**Specifications :** The Temperature should be within "TEMP = E0" and "TEMP = 1F".	**Specifications :** The "TEMP = [illegible]" should be within "E0 – EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".

5. Addition to the countermeasure board.

[Differences in Circuits According to IC271 Type]

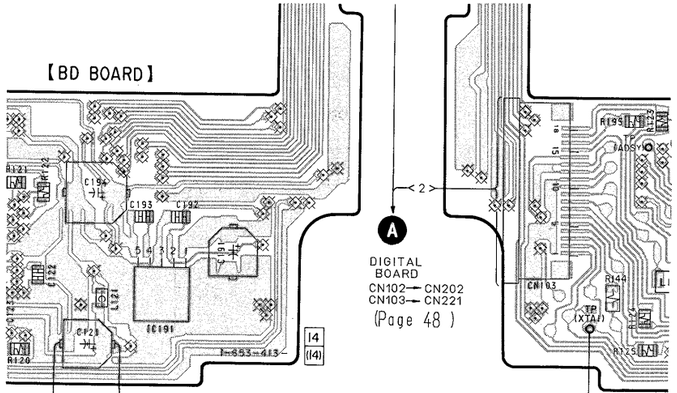
CXD2536R and CXD2536AR are used for the digital board IC271 (ATRACK ENCODE/DECODE SHOCK MEMORY CONTROLLER). The circuit differs partially according to which type of IC is used. (Countermeasure board, etc.)
The detailed differences are shown in the following table.
As the CXD2536R and CXD2536AR are not interchangeable, confirm the model name of the unit when replacing parts, etc.

- **List of Differences**

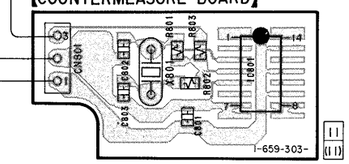
Board	Unit Using CXD2536R					Unit Using CXD2536AR				
	Ref.No	Part No	Description		Remark	Ref.No	Part No	Description		Remark
Digital	C275	1-163-091-00	CERAMIC, CHIP	8PF	50V	C275	1-163-227-11	CERAMIC, CHIP	10PF	50V
	C276	1-163-091-00	CERAMIC, CHIP	8PF	50V	C276	1-163-227-11	CERAMIC, CHIP	10PF	50V
	C284	1-163-227-11	CERAMIC, CHIP	10PF	50V	C284	DELETE			
	FB272	1-216-295-91	CONDUCTOR, CHIP			FB272	DELETE			
	IC271	8-752-371-17	IC CXD2536R			IC271	8-752-375-50	IC CXD2536AR		
	R276	1-216-037-00	METAL CHIP	330 5%	1/10W	R276	1-216-295-00	CONDUCTOR, CHIP		
	R281	1-216-041-00	METAL CHIP	470 5%	1/10W	R281	DELETE			
	R284	1-216-063-91	METAL CHIP	3.9K 5%	1/10W	R284	1-216-066-11	METAL CHIP	5.1K 5%	1/10W
	X203	1-760-841-11	VIBRATOR, CRISTAL (45MHz)			X203	1-579-069-11	VIBRATOR, CRISTAL (49.152MHz)		
Counter-measure	C801	NOT USED				C801	1-163-038-91	CERAMIC, CHIP	0.1uF	25V
	C802	NOT USED				C802	1-163-222-11	CERAMIC, CHIP	5PF	50V
	C803	NOT USED				C803	1-163-222-11	CERAMIC, CHIP	5PF	50V
	R801	NOT USED				R801	1-216-121-91	METAL CHIP	1M 5%	1/10W
	R802	NOT USED				R802	1-216-017-91	METAL CHIP	47 5%	1/10W
	R803	NOT USED				R803	1-216-025-91	METAL CHIP	100 5%	1/10W
	IC801	NOT USED				IC801	8-759-269-92	IC SN74HC04ANS		
	X801	NOT USED				X801	1-567-815-11	VIBRATOR, CRISTAL (22.5792MHz)		

Note: The countermeasure board is not provided as a repair part.

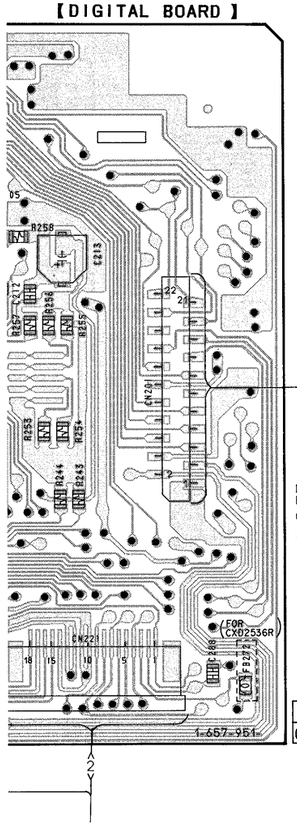
【BD BOARD】



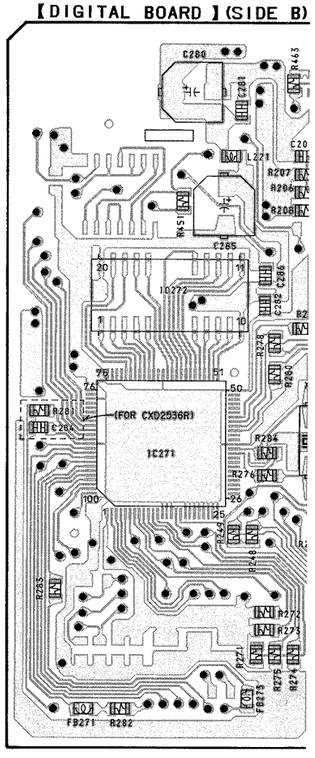
【COUNTERMEASURE BOARD】



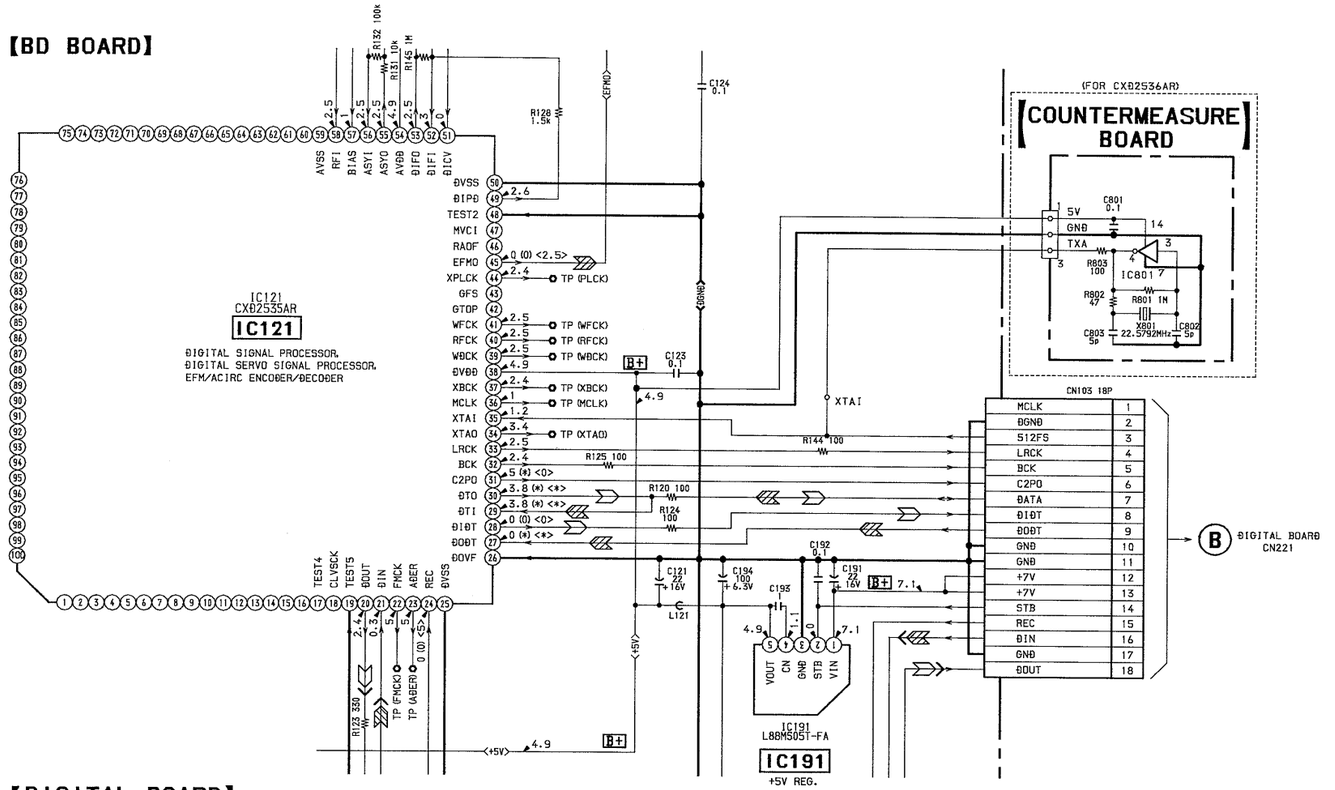
【DIGITAL BOARD】



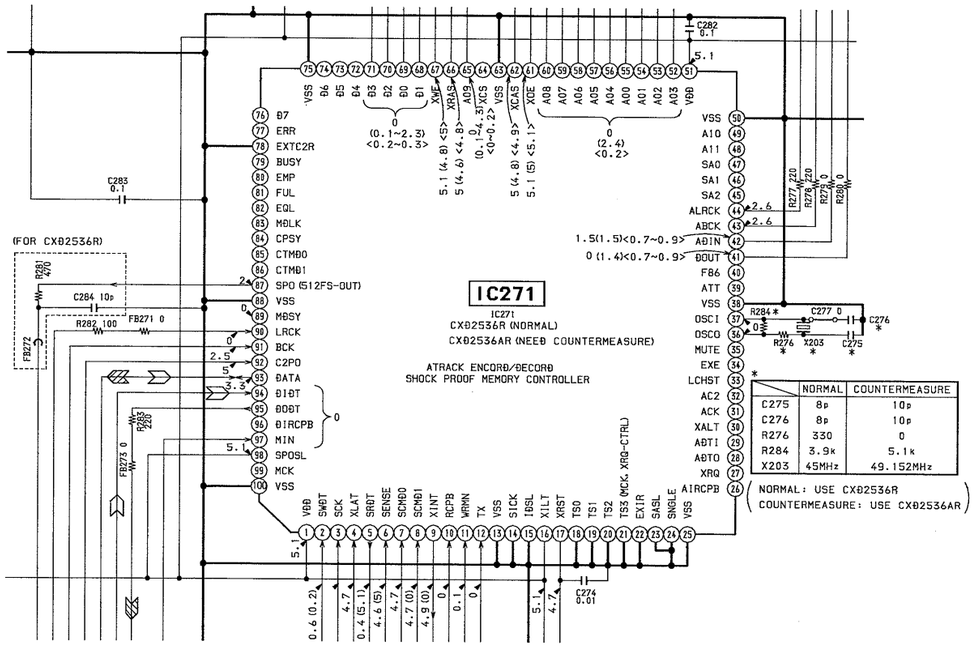
【DIGITAL BOARD】(SIDE B)



【BD BOARD】



【DIGITAL BOARD】



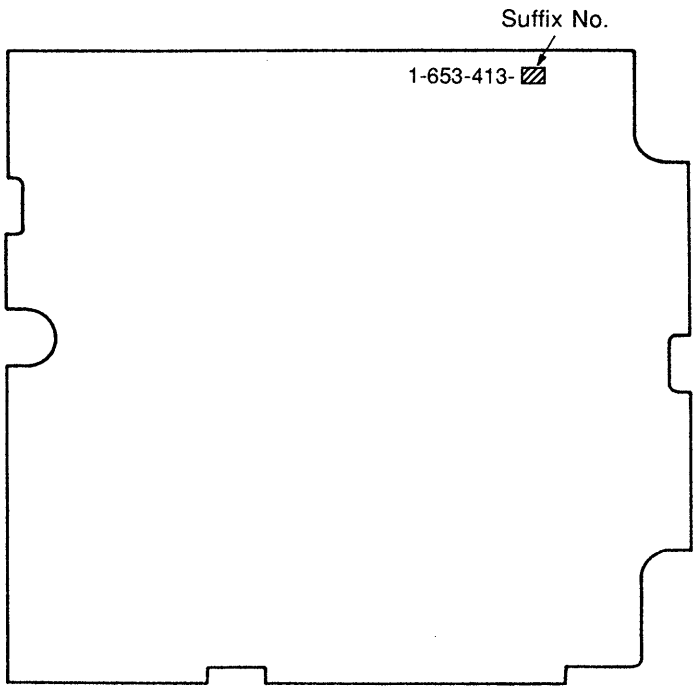
	NORMAL	COUNTERMEASURE
C275	8p	10p
C276	8p	10p
R276	330	0
R284	3.9k	5.1k
X203	45MHz	49.152MHz

6. Board change

- **BD Board change**

NOTE: Many charge of mounting parts are different between boards which have a suffix No. - 15 or later and which have a suffix No. - 14 or before. Refer to this supplement-1 for boards which have a suffix No. - 15 or later. As for boards which have a suffix No. - 14 or before, refer to the previous issued manual (9-960-354-11).

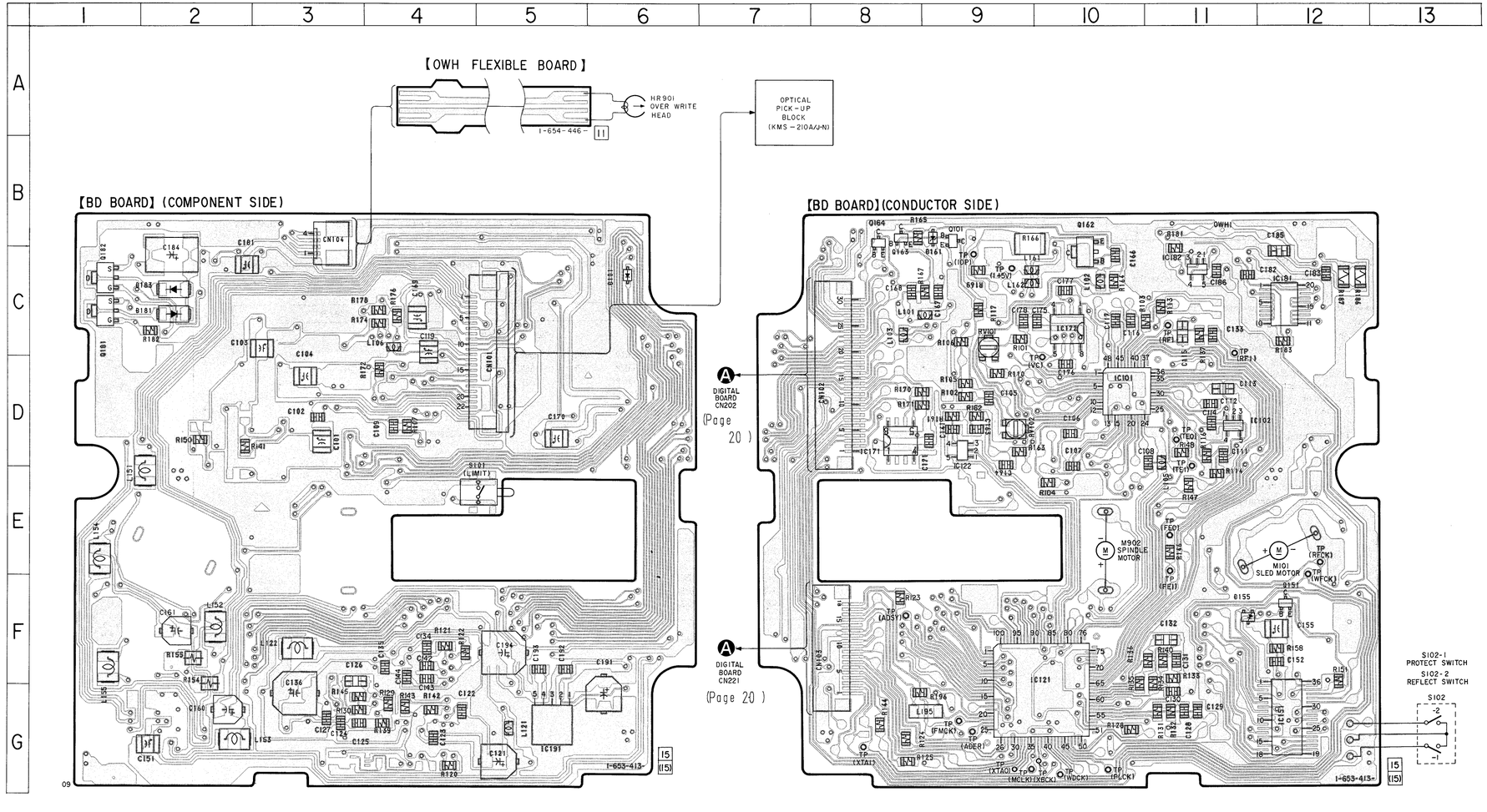
- **Part No. Location — BD board — (Component side)**



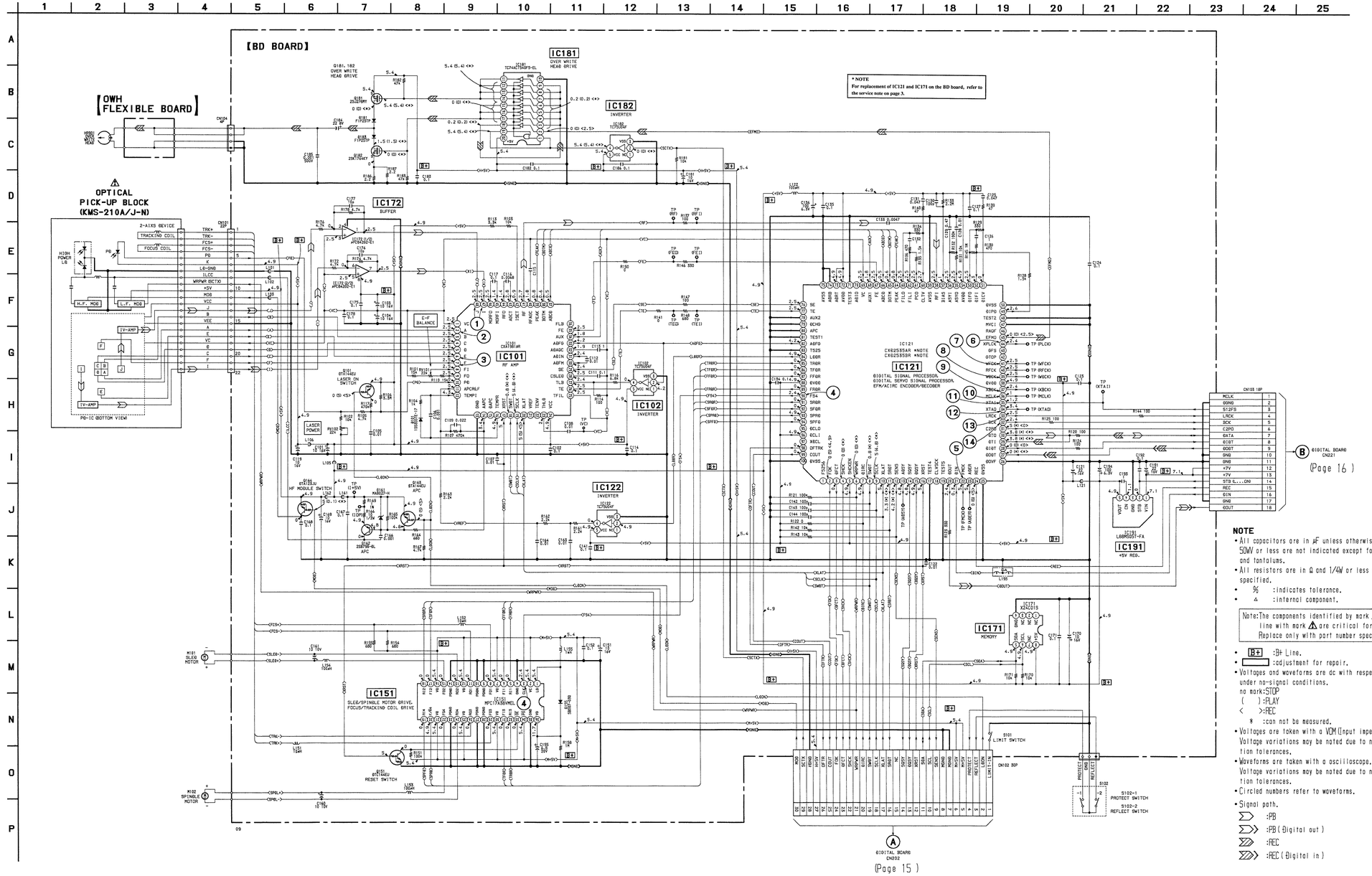
• **Semiconductor Location**

Ref. No.	Location
D101	C-6
D155	F-11
D161	B-8
D181	C-2
D183	C-2
IC101	D-10
IC102	D-11
IC121	F-9
IC122	D-9
IC151	G-12
IC171	D-8
IC172	C-10
IC181	C-12
IC182	C-11
IC191	G-5
Q101	B-9
Q151	F-12
Q162	B-10
Q163	B-8
Q164	B-8
Q181	C-1
Q182	C-1

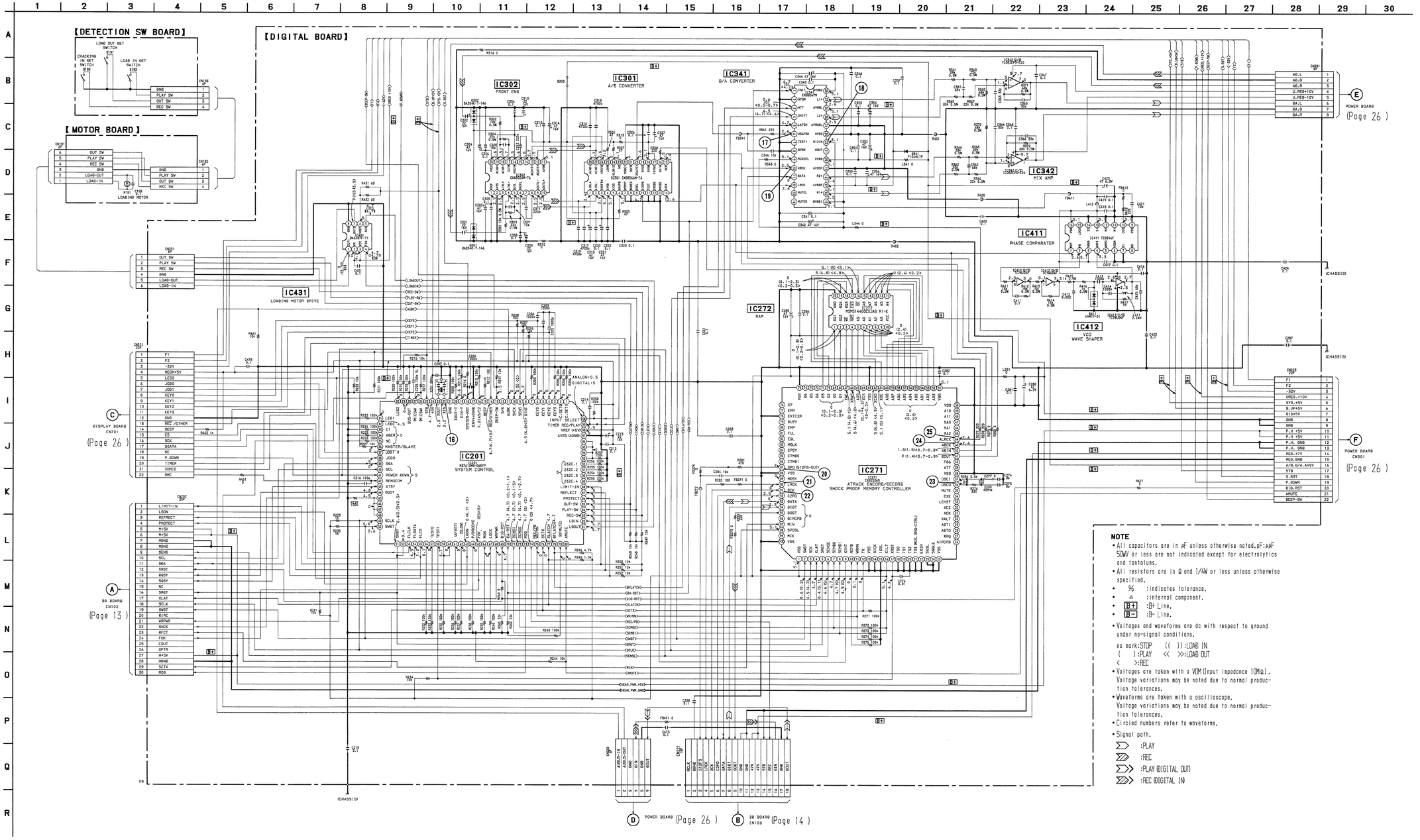
Note:
- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- ○ : Through hole.
- ▭ : Pattern from the side which enable seeing. (The other layer's patterns are not indicated.)



SCHEMATIC DIAGRAM — RF SECTION —


【BD BOARD】
【OWH FLEXIBLE BOARD】
⚠ OPTICAL PICK-UP BLOCK (KMS-210A/J-N)
IC181 OVER WRITE HEAD DRIVE
IC182 INVERTER
IC172 BUFFER
IC101 RF AMP
IC102 INVERTER
IC121 0101TAL SIGNAL PROCESSOR, 0101TAL SERVO SIGNAL PROCESSOR, EFM/ACIRC ENCODER/DECODER
IC122 INVERTER
IC171 MEMORY
IC191 +5V REG.
IC151 SLED/SPINDLE MOTOR DRIVE, FOCUS/TRACKING COIL DRIVE
* NOTE
For replacement of IC121 and IC171 on the BD board, refer to the service note on page 3.
0101TAL BOARD CN221
(Page 16)
0101TAL BOARD CN202
(Page 15)
NOTE
• All capacitors are in μF unless otherwise noted. pF: μF 50WV or less are not indicated except for electrolytics and tantaluns.
• All resistors are in Ω and 1/4W or less unless otherwise specified.
• % :indicates tolerance.
• Δ :internal component.
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
• B+ :B+ Line.
• :adjustment for repair.
• Voltages and waveforms are dc with respect to ground under no-signal conditions.
no mark: STOP
( ): PLAY
< >: REC
* :can not be measured.
• Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
• Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
• Circled numbers refer to waveforms.
• Signal path.
:PB
:PB (Digital out)
:REC
:REC (Digital in)

SCHEMATIC DIAGRAM — DIGITAL SECTION —



PRINTED WIRING BOARDS — DIGITAL SECTION —

【DIGITAL BOARD】(SIDE A)

【DIGITAL BOARD】(SIDE B)

【DETECTION SW BOARD】

【MOTOR BOARD】

- **Semiconductor Location**

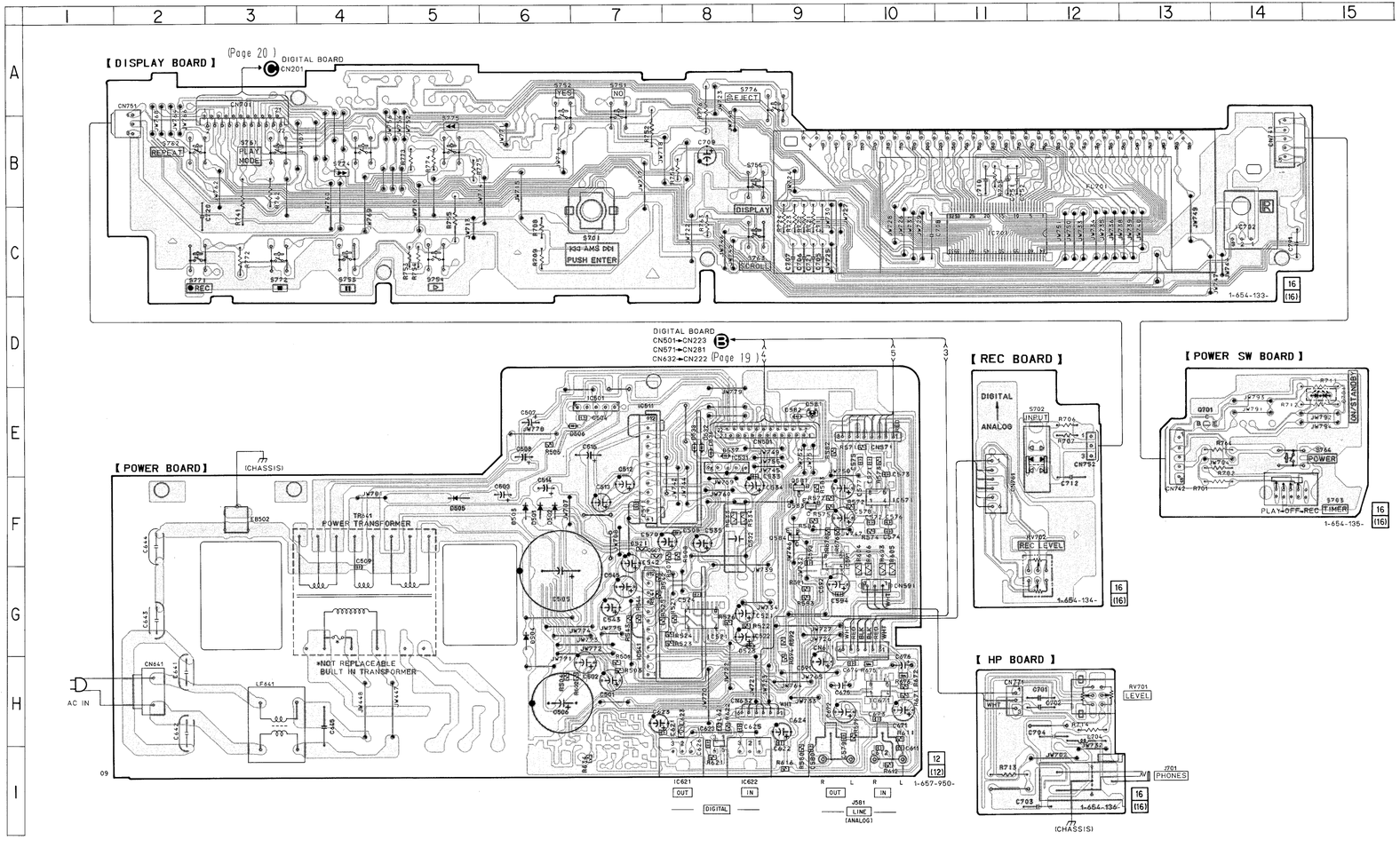
Ref. No.	Location
D301	C-14
D302	E-15
D303	D-2
D341	C-15
D411	C-4
IC201	C-5
IC271	D-10
IC272	C-10
IC301	D-14
IC302	D-15
IC341	C-14
IC342	B-3
IC411	B-4
IC412	B-13
IC431	F-14

Note:
- ○——○ : parts extracted from the component side.
- ● : Through hole.
- ▨ : Pattern from the side which enable seeing. (The other layer's patterns are not indicated.)

PRINTED WIRING BOARDS — DISPLAY/POWER SECTION —

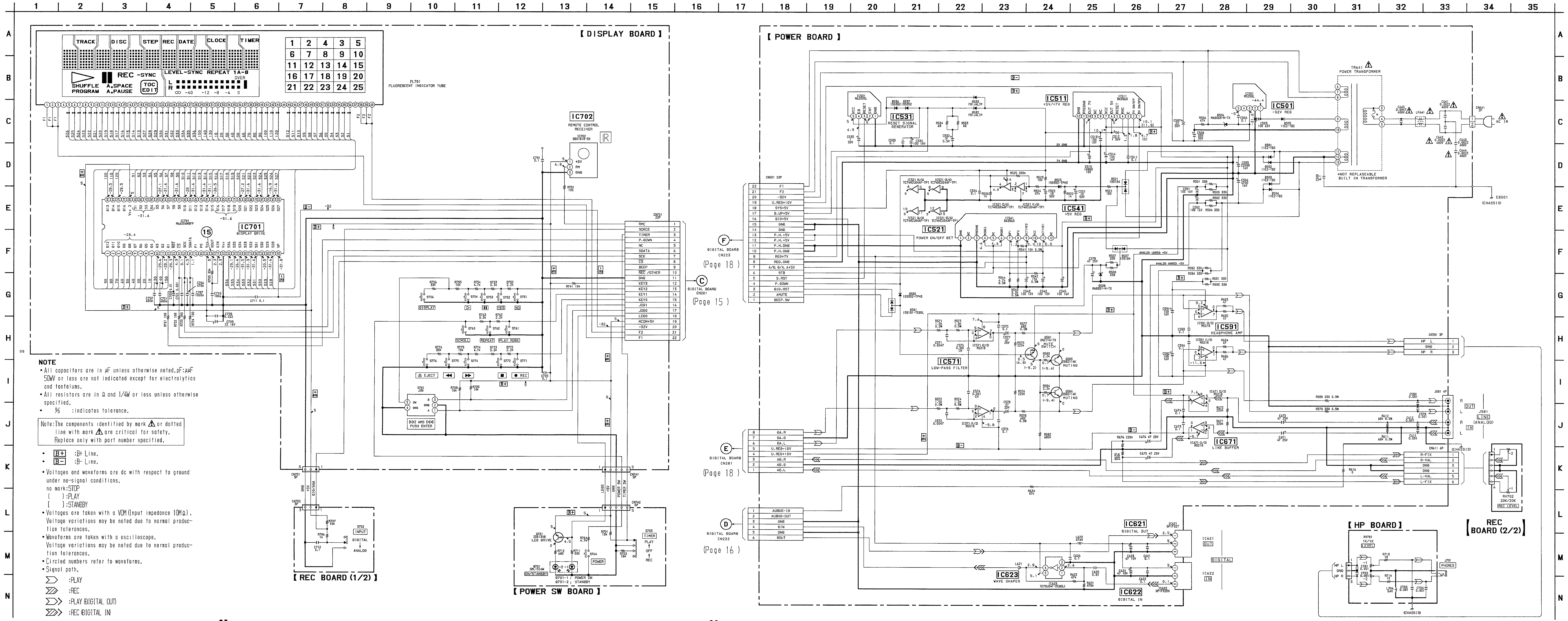
- **Semiconductor Location**

Ref. No.	Location
D501	F-6
D502	F-6
D503	F-6
D504	G-6
D505	F-5
D506	E-6
D507	F-7
D508	F-8
D521	F-7
D523	G-8
D532	E-8
D533	E-8
D536	E-8
D537	E-8
D581	E-9
D582	E-9
D701	E-15
IC501	E-7
IC511	E-7
IC521	G-8
IC531	E-8
IC541	G-7
IC571	F-10
IC591	F-9
IC621	I-8
IC622	I-8
IC623	I-8
IC671	H-10
IC701	C-11
IC702	C-14
Q581	F-9
Q583	F-9
Q584	F-9
Q701	E-13



Note:
- ○—— : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ▭ : Pattern on the side which seen.

SCHEMATIC DIAGRAM — DISPLAY/POWER SECTION —


【DISPLAY BOARD】
FL701
FLUORESCENT INDICATOR TUBE
IC701
DISPLAY DRIVE
IC701 M66004M8FP
IC702
REMOTE CONTROL RECEIVER
IC702 SBX1810-59
CN701 22P
DIGITAL BOARD CN201
(Page 15)
【POWER BOARD】
CN501 22P
DIGITAL BOARD CN223
(Page 18)
IC531
RESET SIGNAL GENERATOR
IC531 M62005L
IC511
+5V/+7V REG
IC511 BA3963
IC501
-32V REG
IC501 M5293L
TR641
POWER TRANSFORMER
*NOT REPLASEABLE
BUILT IN TRANSFORMER
CN641 2P
AC IN
EB501 (CHASSIS)
IC541
+5V REG
IC541 BA3960
IC521
POWER ON/OFF DET
IC571
LOW-PASS FILTER
Q581 UN2114-TX MUTE SWITCH
Q583 2SD2114K MUTING
Q584 2SD2114K MUTING
IC591
HEADPHONE AMP
IC671
LINE BUFFER
CN591 3P
J581 4P
J581 LINE (ANALOG)
CN611 6P
DIGITAL BOARD CN281
(Page 18)
DIGITAL BOARD CN222
(Page 16)
IC621
DIGITAL OUT
IC622
DIGITAL IN
IC623
WAVE SHAPER
【REC BOARD (1/2)】
S702 INPUT DIGITAL ANALOG
【POWER SW BOARD】
D701-1 : POWER ON
D701-2 : STANDBY
S703 TIMER PLAY OFF REC
【HP BOARD】
RV701 1K/1K LEVEL
J701 PHONES
REC BOARD (2/2)
RV702 20K/20K REC LEVEL

NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % : indicates tolerance.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ : B+ Line.
- B− : B− Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP
  ( ) : PLAY
  [ ] : STANDBY
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ▷ : PLAY
  ▷ : REC
  ▷▷ : PLAY (DIGITAL OUT)
  ▷▷ : REC (DIGITAL IN)

ELECTRICAL PARTS LIST

NOTE:

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

* NOTE
For replacement of IC121 and IC171 on the BD board, refer to the service note on page 3.

Ref.No.	Part No.	Description			Remark
*	A-4673-174-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C104	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C113	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C114	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C115	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C116	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C119	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C121	1-126-395-11	ELECT	22uF	20%	16V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C125	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C126	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C128	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C131	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C132	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C151	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C155	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V
C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C163	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C164	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C166	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C168	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C169	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C170	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C175	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C176	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C177	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C178	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C181	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C182	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C183	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C184	1-107-836-11	ELECT CHIP	22uF	20%	8V
C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C186	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C191	1-126-395-11	ELECT	22uF	20%	16V
C192	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C193	1-164-346-11	CERAMIC CHIP	1uF		16V
C194	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
		< CONNECTOR >			
CN101	1-766-508-11	CONNECTOR, FFC/FPC (ZIF) 22P			
CN102	1-766-510-21	CONNECTOR, FFC/FPC 30P			
CN103	1-766-509-21	CONNECTOR, FFC/FPC 18P			
CN104	1-766-898-21	HOUSING, CONNECTOR(PC BOARD) 4P			
		< DIODE >			
D101	8-719-988-62	DIODE 1SS355			
D155	8-719-031-17	DIODE 1SS322-TE85L			
D161	8-719-421-15	DIODE MA8027-L			
D181	8-719-033-60	DIODE F1P2STP			
D183	8-719-033-60	DIODE F1P2STP			
		< IC >			
IC101	8-752-072-68	IC CXA1981AR			
IC102	8-759-243-19	IC TC7SU04F			
IC121	8-752-375-06	IC CXD2535AR * NOTE			

BD

Ref.No.	Part No.	Description	Remark
IC121	8-752-375-36	IC CXD2535BR * NOTE	
IC122	8-759-243-19	IC TC7SU04F	
IC151	8-759-179-60	IC MPC17A38VMEL	
IC171	8-759-504-12	IC X24C01S * NOTE	
IC172	8-759-149-73	IC uPC842G2	
IC181	8-759-095-65	IC TC74ACT540FS	
IC182	8-759-243-19	IC TC7SU04F	
IC191	8-759-822-99	IC L88MS05T-FA	
		< COIL >	
L101	1-414-234-11	INDUCTOR, FERRITE BEAD	
L102	1-414-234-11	INDUCTOR, FERRITE BEAD	
L103	1-414-234-11	INDUCTOR, FERRITE BEAD	
L105	1-414-234-11	INDUCTOR, FERRITE BEAD	
L106	1-414-234-11	INDUCTOR, FERRITE BEAD	
L121	1-414-234-11	INDUCTOR, FERRITE BEAD	
L122	1-412-039-51	INDUCTOR CHIP 100uH	
L151	1-412-622-51	INDUCTOR 10uH	
L152	1-412-622-51	INDUCTOR 10uH	
L153	1-412-039-51	INDUCTOR CHIP 100uH	
L154	1-412-039-51	INDUCTOR CHIP 100uH	
L155	1-410-980-51	INDUCTOR CHIP 1mH	
L161	1-414-234-11	INDUCTOR, FERRITE BEAD	
L162	1-414-234-11	INDUCTOR, FERRITE BEAD	
L195	1-233-316-21	FILTER, CHIP EMI	
		< TRANSISTOR >	
Q101	8-729-905-12	TRANSISTOR DTA144EU	
Q151	8-729-905-18	TRANSISTOR DTC144EU	
Q162	8-729-101-07	TRANSISTOR 2SB798-DL	
Q163	8-729-905-12	TRANSISTOR DTA144EU	
Q164	8-729-924-19	TRANSISTOR DTA123JU	
Q181	8-729-018-75	TRANSISTOR 2SJ278MY	
Q182	8-729-017-65	TRANSISTOR 2SK1764KY	
		< RESISTOR >	
R101	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R102	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R103	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R104	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R105	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R106	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R107	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R110	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R113	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R114	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R116	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R117	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R120	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R121	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R122	1-216-295-91	CONDUCTOR, CHIP (2012)	
R123	1-216-037-00	METAL CHIP 330 5% 1/10W	
R124	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R125	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R128	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R129	1-216-037-00	METAL CHIP 330 5% 1/10W	
R130	1-216-041-00	METAL CHIP 470 5% 1/10W	
R131	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R132	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R133	1-216-129-00	METAL CHIP 2.2M 5% 1/10W	
R134	1-216-037-00	METAL CHIP 330 5% 1/10W	
R135	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R136	1-216-041-00	METAL CHIP 470 5% 1/10W	
R137	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R139	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R140	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R141	1-216-295-91	CONDUCTOR, CHIP (2012)	
R142	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R143	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R144	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R145	1-216-121-91	METAL GLAZE 1M 5% 1/10W	
R146	1-216-037-00	METAL CHIP 330 5% 1/10W	
R147	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R148	1-216-045-00	METAL CHIP 680 5% 1/10W	
R150	1-216-295-91	CONDUCTOR, CHIP (2012)	
R151	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R154	1-220-262-11	METAL GLAZE 680 5% 1/4W	
R155	1-220-262-11	METAL GLAZE 680 5% 1/4W	
R158	1-216-121-91	METAL GLAZE 1M 5% 1/10W	
R161	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R162	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R163	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R164	1-216-045-00	METAL CHIP 680 5% 1/10W	
R165	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R166	1-220-250-11	METAL GLAZE 10 5% 1/2W	
R167	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R169	1-219-724-11	METAL CHIP 1 1% 1/4W	
R170	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R171	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R172	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R174	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R176	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R178	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R181	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R182	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R183	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R186	1-216-134-00	METAL CHIP 2.2 5% 1/8W	
R187	1-216-134-00	METAL CHIP 2.2 5% 1/8W	

* NOTE
For replacement of IC121 and IC171 on the BD board, refer to the service note on page 3.

Ref.No.	Part No.	Description			Remark
		< VARIABLE RESISTOR >			
RV101	1-241-396-11	RES, ADJ, METAL GLAZE 22K			
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K			
		< SWITCH >			
S101	1-572-467-31	SWITCH, PUSH (1 KEY)(LIMIT)			
**********					
*	A-4673-635-A	DIGITAL BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C202	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C203	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C204	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C206	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C207	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C209	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C212	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C213	1-126-395-11	ELECT	22uF	20%	16V
C214	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C215	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C216	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C274	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C275	1-163-091-00	CERAMIC CHIP	8PF		50V
C276	1-163-091-00	CERAMIC CHIP	8PF		50V
C277	1-216-295-91	CONDUCTOR, CHIP			
C280	1-126-205-11	ELECT	47uF	20%	6.3V
C281	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C282	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C283	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C284	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C285	1-126-204-11	ELEC CHIP	47uF	20%	16V
C286	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C287	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C288	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C301	1-126-395-11	ELECT	22uF	20%	16V
C302	1-126-395-11	ELECT	22uF	20%	16V
C303	1-126-204-11	ELECT	47uF	20%	16V
C304	1-126-204-11	ELECT	47uF	20%	16V
C305	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C306	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C307	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C308	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C309	1-126-395-11	ELECT	22uF	20%	16V
C310	1-126-395-11	ELECT	22uF	20%	16V
C311	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C312	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C313	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C314	1-126-204-11	ELECT	47uF	20%	16V
C315	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C316	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C317	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C318	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C319	1-126-204-11	ELECT	47uF	20%	16V
C320	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C321	1-126-204-11	ELECT	47uF	20%	16V
C322	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C323	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C326	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C327	1-126-204-11	ELECT CHIP	47uF	20%	16V
C331	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C333	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C334	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C341	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C342	1-126-204-11	ELECT CHIP	47uF	20%	16V
C343	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C344	1-126-204-11	ELECT CHIP	47uF	20%	16V
C346	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C348	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C352	1-126-204-11	ELECT CHIP	47uF	20%	16V
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C354	1-126-204-11	ELECT CHIP	47uF	20%	16V
C355	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C356	1-126-204-11	ELECT CHIP	47uF	20%	16V
C357	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C361	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C362	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C363	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C364	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C365	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C366	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C367	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C368	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C411	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C412	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C413	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C415	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C416	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C417	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C418	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C419	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C420	1-126-205-11	ELECT	47uF	20%	6.3V
C421	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C422	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C423	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C424	1-163-038-91	CERAMIC CHIP	0.1uF		25V

Ref.No.	Part No.	Description	Remark
C431	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C473	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C478	1-163-038-91	CERAMIC CHIP 0.1uF	25V
		< CONNECTOR >	
CN201	1-774-287-11	CONNECTOR (FFC) 22P	
CN202	1-774-031-21	CONNECTOR, FFC/FPC 30P	
CN221	1-774-030-21	CONNECTOR, FFC/FPC 18P	
* CN222	1-770-154-11	PIN, CONNECTOR (PC BOARD) 6P	
CN223	1-774-287-11	CONNECTOR (FFC) 22P	
* CN251	1-770-154-11	PIN, CONNECTOR (PC BOARD) 6P	
* CN281	1-770-153-11	PIN, CONNECTOR (PC BOARD) 8P	
		< DIODE >	
D301	8-719-914-42	DIODE DA204K	
D302	8-719-914-42	DIODE DA204K	
D303	1-216-295-91	CONDUCTOR, CHIP	
D341	8-719-056-15	DIODE F01J4L	
D411	8-719-974-98	DIODE HVM17-01	
		< FERRITE BEAD >	
FB271	1-216-295-91	CONDUCTOR, CHIP	
FB272	1-414-235-11	INDUCTOR, FERRITE BEAD	
FB273	1-216-295-91	CONDUCTOR, CHIP	
FB274	1-216-295-91	CONDUCTOR, CHIP	
FB341	1-414-235-11	INDUCTOR, FERRITE BEAD	
FB411	1-414-235-11	INDUCTOR, FERRITE BEAD	
FB412	1-216-295-91	CONDUCTOR, CHIP	
FB471	1-216-295-91	CONDUCTOR, CHIP	
		< IC >	
IC201	8-759-387-02	IC M37610MD-065FP	
IC271	8-752-371-17	IC CXD2536R	
IC272	8-759-329-31	IC MSM514400CSJADR1-K	
IC301	8-759-352-63	IC CXD8566M-T6	
IC302	8-759-352-59	IC CXA8054M-T6	
IC341	8-759-362-47	IC CXD8567AM-T6	
IC342	8-759-981-48	IC TL082M	
IC411	8-759-158-96	IC TC9246F	
IC412	8-759-242-70	IC TC7WU04F	
IC431	8-759-040-83	IC BA6287F	
		< COIL >	
L221	1-216-295-91	CONDUCTOR, CHIP	
L341	1-216-295-91	CONDUCTOR, CHIP	
L344	1-216-295-91	CONDUCTOR, CHIP	
L411	1-412-332-41	INDUCTOR 2.2uH	
L412	1-414-386-11	INDUCTOR, FERRITE BEAD	
		< RESISTOR >	
R203	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R204	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R205	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R206	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R207	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R208	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R209	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R211	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R212	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R213	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R214	1-216-295-91	CONDUCTOR, CHIP	
R215	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R216	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R217	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R218	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R219	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R220	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R221	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R222	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R223	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R224	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R225	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R226	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R227	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R228	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R229	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R230	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R231	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R232	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R233	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R234	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R235	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R236	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R237	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R238	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R239	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R240	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R241	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R242	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R243	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R244	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R245	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R246	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R247	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R248	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R249	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R250	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R251	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R252	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R253	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R254	1-216-097-91	METAL GLAZE 100K 5% 1/10W	

Ref.No.	Part No.	Description			Remark
R255	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R256	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R257	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R258	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R259	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R260	1-216-295-91	CONDUCTOR, CHIP			
R271	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R272	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R273	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R274	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R275	1-216-097-91	METAL GLAZE	100K	5% 1/10W	
R276	1-216-037-00	METAL CHIP	330	5% 1/10W	
R277	1-216-033-00	METAL CHIP	220	5% 1/10W	
R278	1-216-033-00	METAL CHIP	220	5% 1/10W	
R279	1-216-295-91	CONDUCTOR, CHIP			
R280	1-216-295-91	CONDUCTOR, CHIP			
R281	1-216-041-00	METAL GLAZE	470	5% 1/10W	
R282	1-216-025-00	METAL GLAZE	100	5% 1/10W	
R283	1-216-033-00	METAL CHIP	220	5% 1/10W	
R284	1-216-063-91	METAL GLAZE	3.9K	5% 1/10W	
R301	1-208-806-11	METAL CHIP	10K	0.5% 1/10W	
R302	1-208-806-11	METAL CHIP	10K	0.5% 1/10W	
R303	1-208-814-11	METAL CHIP	22K	0.5% 1/10W	
R304	1-208-814-11	METAL CHIP	22K	0.5% 1/10W	
R305	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R306	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R307	1-216-017-91	METAL GLAZE	47	5% 1/10W	
R308	1-216-033-00	METAL CHIP	220	5% 1/10W	
R310	1-216-295-91	CONDUCTOR, CHIP			
R313	1-216-295-91	CONDUCTOR, CHIP			
R316	1-216-295-91	CONDUCTOR, CHIP			
R341	1-216-033-00	METAL GLAZE	220	5% 1/10W	
R343	1-216-295-91	CONDUCTOR, CHIP			
R361	1-216-687-11	METAL CHIP	33K	0.5% 1/10W	
R362	1-216-687-11	METAL CHIP	33K	0.5% 1/10W	
R363	1-208-814-11	METAL CHIP	22K	0.5% 1/10W	
R364	1-208-814-11	METAL CHIP	22K	0.5% 1/10W	
R365	1-216-687-11	METAL CHIP	33K	0.5% 1/10W	
R366	1-216-687-11	METAL CHIP	33K	0.5% 1/10W	
R367	1-208-814-11	METAL CHIP	22K	0.5% 1/10W	
R368	1-208-814-11	METAL CHIP	22K	0.5% 1/10W	
R369	1-216-695-11	METAL CHIP	68K	0.5% 1/10W	
R370	1-216-695-11	METAL CHIP	68K	0.5% 1/10W	
R371	1-216-695-11	METAL CHIP	68K	0.5% 1/10W	
R372	1-216-695-11	METAL CHIP	68K	0.5% 1/10W	
R401	1-414-386-11	INDUCTOR, FERRITE BEAD			
R402	1-414-386-11	INDUCTOR, FERRITE BEAD			
R411	1-208-810-11	METAL CHIP	15K	0.50% 1/10W	
R412	1-208-810-11	METAL CHIP	15K	0.50% 1/10W	
R413	1-208-810-11	METAL CHIP	15K	0.50% 1/10W	
R414	1-208-810-11	METAL CHIP	15K	0.50% 1/10W	
R415	1-216-651-11	METAL CHIP	1K	0.5% 1/10W	
R416	1-216-651-11	METAL CHIP	1K	0.5% 1/10W	
R417	1-216-121-91	METAL GLAZE	1M	5% 1/10W	
R418	1-216-033-00	METAL GLAZE	220	5% 1/10W	
R420	1-414-386-11	INDUCTOR, FERRITE BEAD			
R431	1-216-021-00	METAL CHIP	68	5% 1/10W	
R432	1-216-021-00	METAL CHIP	68	5% 1/10W	
R451	1-216-295-91	CONDUCTOR, CHIP			
R461	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R463	1-216-049-91	METAL GLAZE	1K	5% 1/10W	
R471	1-216-295-91	CONDUCTOR, CHIP			
		< VIBRATOR >			
X201	1-760-493-11	VIBRATOR, CERAMIC (CHIP TYPE) (8MHz)			
X203	1-760-841-11	VIBRATOR, CRYSTAL (45MHz)			
**********					
*	A-4673-746-A	DISPLAY BOARD, COMPLETE			
		**********			
	1-690-880-51	LEAD (WITH CONNECTOR)			
	2-389-320-01	CUSHION			
		< CAPACITOR >			
C705	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C706	1-162-290-31	CERAMIC	470PF	10% 50V	
C707	1-162-294-31	CERAMIC	0.001uF	10% 50V	
C708	1-161-494-00	CERAMIC	0.022uF	25V	
C709	1-124-234-00	ELECT	22uF	20% 16V	
C710	1-162-282-31	CERAMIC	100PF	10% 50V	
C711	1-164-159-11	CERAMIC	0.1uF	50V	
C720	1-164-159-11	CERAMIC	0.1uF	50V	
C721	1-162-294-31	CERAMIC	0.001uF	10% 50V	
C751	1-162-292-31	CERAMIC	680PF	10% 50V	
C752	1-162-292-31	CERAMIC	680PF	10% 50V	
C791	1-164-159-11	CERAMIC	0.1uF	50V	
		< CONNECTOR >			
CN701	1-774-288-11	CONNECTOR, FFC 22P			
CN741	1-766-200-11	SOCKET, CONNECTOR PIN 5P			
CN751	1-766-806-11	HOUSING, CONNECTOR 3P			
		< FLUORESCENT INDICATOR >			
FL701	1-517-353-11	INDICATOR TUBE, FLUORESCENT			
		< HOLDER >			
* FLH701	4-956-134-01	HOLDER (FL TUBE)			

DISPLAY | HP | MOTOR | OWH | POWER

Ref.No.	Part No.	Description			Remark
		< IC >			
IC701	8-759-297-23	IC M66004M8FP			
IC702	8-741-810-59	IC ELEMENT, RAY-CATCHER SBX1810-59 (Ⓡ)			
		< RESISTOR >			
R705	1-249-435-11	CARBON	33K	5% 1/4W	
R708	1-249-429-11	CARBON	10K	5% 1/4W	
R709	1-249-429-11	CARBON	10K	5% 1/4W	
R721	1-247-807-31	CARBON	100	5% 1/4W	
R722	1-247-807-31	CARBON	100	5% 1/4W	
R723	1-247-807-31	CARBON	100	5% 1/4W	
R724	1-247-807-31	CARBON	100	5% 1/4W	
R741	1-249-429-11	CARBON	10K	5% 1/4W	
R752	1-249-421-11	CARBON	2.2K	5% 1/4W	
R753	1-249-423-11	CARBON	3.3K	5% 1/4W	
R754	1-249-425-11	CARBON	4.7K	5% 1/4W	
R755	1-249-429-11	CARBON	10K	5% 1/4W	
R756	1-249-435-11	CARBON	33K	5% 1/4W	
R762	1-249-421-11	CARBON	2.2K	5% 1/4W	
R763	1-249-423-11	CARBON	3.3K	5% 1/4W	
R772	1-249-421-11	CARBON	2.2K	5% 1/4W	
R773	1-249-423-11	CARBON	3.3K	5% 1/4W	
R774	1-249-425-11	CARBON	4.7K	5% 1/4W	
R775	1-249-429-11	CARBON	10K	5% 1/4W	
R776	1-249-435-11	CARBON	33K	5% 1/4W	
R791	1-247-807-31	CARBON	100	5% 1/4W	
		< SWITCH >			
S701	1-467-891-11	ENCODER, ROTARY (⏮ AMS ⏭, PUSH ENTER)			
S751	1-554-303-21	SWITCH, TACTILE (EDIT NO)			
S752	1-554-303-21	SWITCH, TACTILE (YES)			
S753	1-554-303-21	SWITCH, TACTILE (⏸)			
S754	1-554-303-21	SWITCH, TACTILE (▷)			
S756	1-554-303-21	SWITCH, TACTILE (DISPLAY)			
S761	1-554-303-21	SWITCH, TACTILE (PLAY MODE)			
S762	1-554-303-21	SWITCH, TACTILE (REPEAT)			
S763	1-554-303-21	SWITCH, TACTILE (SCROLL)			
S771	1-554-303-21	SWITCH, TACTILE (● REC)			
S772	1-554-303-21	SWITCH, TACTILE (■)			
S774	1-554-303-21	SWITCH, TACTILE (▶▶)			
S775	1-554-303-21	SWITCH, TACTILE (◀◀)			
S776	1-554-303-21	SWITCH, TACTILE (⏏ EJECT)			

****

Ref.No.	Part No.	Description			Remark
*	1-654-136-11	HP BOARD ********			
		< CAPACITOR >			
C701	1-162-294-31	CERAMIC	0.001uF	10% 50V	
C702	1-162-294-31	CERAMIC	0.001uF	10% 50V	
C703	1-162-294-31	CERAMIC	0.001uF	10% 50V	
C704	1-162-294-31	CERAMIC	0.001uF	10% 50V	
		< JACK >			
J701	1-770-306-11	JACK, LARGE TYPE (PHONES)			
		< COIL >			
L704	1-412-473-21	INDUCTOR	0uH		
		< RESISTOR >			
R713	1-249-393-11	CARBON	10	5% 1/4W	
R714	1-249-393-11	CARBON	10	5% 1/4W	
		< VARIABLE RESISTOR >			
RV701	1-223-752-11	RES, VAR, CARBON 1K/1K (LEVEL)			

****

*	1-653-412-11	MOTOR BOARD **********			
		< CAPACITOR >			
C199	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN191	1-568-944-11	PIN, CONNECTOR 6P			
CN192	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P			

****

	1-654-446-11	OWH FLEXIBLE BOARD ******************			

****

*	A-4673-633-A	POWER BOARD, COMPLETE **********			
*	1-535-303-00	WIRE, JUMPER			
	7-682-548-09	SCREW +BVTT 3X8 (S)			
		< CAPACITOR >			
C501	1-126-933-11	ELECT	100uF	20%	16V
C502	1-126-933-11	ELECT	100uF	20%	16V
C503	1-128-576-11	ELECT	100uF	20%	63V
C504	1-165-319-11	CERAMIC CHIP	0.1uF		50V

Ref.No.	Part No.	Description			Remark
C505	1-115-162-11	ELECT	22000uF	20%	16V
C506	1-126-937-11	ELECT	4700uF	20%	16V
C507	1-126-965-11	ELECT	22uF	20%	50V
C508	1-126-950-11	ELECT	330uF	20%	35V
C509	1-163-038-91	CERAMIC	0.1uF		25V
C511	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C512	1-124-903-11	ELECT	1uF	20%	50V
C513	1-126-933-11	ELECT	100uF	20%	16V
C514	1-126-933-11	ELECT	100uF	20%	16V
C515	1-128-546-11	ELECT	10000uF	20%	10V
C521	1-126-964-11	ELECT	10uF	20%	50V
C522	1-126-964-11	ELECT	10uF	20%	50V
C524	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C532	1-110-489-11	CAP, DOUBLE LAYER	1.0F		
C533	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C534	1-126-933-11	ELECT	100uF	20%	16V
C535	1-124-903-11	ELECT	1uF	20%	50V
C542	1-126-933-11	ELECT	100uF	20%	16V
C543	1-126-933-11	ELECT	100uF	20%	16V
C545	1-126-933-11	ELECT	100uF	20%	16V
C570	1-104-664-11	ELECT	47uF	20%	25V
C571	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C572	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C573	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C574	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C575	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C576	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C577	1-124-910-11	ELECT	47uF	20%	50V
C578	1-124-910-11	ELECT	47uF	20%	50V
C579	1-163-275-11	CERAMIC CHIP	1000PF	5%	50V
C580	1-163-275-11	CERAMIC CHIP	1000PF	5%	50V
C591	1-126-933-11	ELECT	100uF	20%	16V
C592	1-126-933-11	ELECT	100uF	20%	16V
C593	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C594	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C611	1-163-009-11	CERAMIC CHIP	1000PF	10%	50V
C612	1-163-009-11	CERAMIC CHIP	1000PF	10%	50V
C621	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C622	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C623	1-126-967-11	ELECT	47uF	20%	10V
C624	1-126-967-11	ELECT	47uF	20%	10V
C625	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C626	1-163-038-91	CERAMIC CHIP	0.1uF		25V
⚠C641	1-161-742-00	CERAMIC	0.0022uF	20%	400V
⚠C642	1-161-742-00	CERAMIC	0.0022uF	20%	400V
⚠C643	1-161-742-00	CERAMIC	0.0022uF	20%	400V
⚠C644	1-161-742-00	CERAMIC	2200PF	20%	400V
⚠C645	1-162-599-12	CERAMIC	0.0047uF		400V
C671	1-124-910-11	ELECT	47uF	20%	50V
C672	1-124-910-11	ELECT	47uF	20%	50V
C673	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C674	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C675	1-124-910-11	ELECT	47uF	20%	50V
C676	1-124-910-11	ELECT	47uF	20%	50V

< CONNECTOR >

CN501	1-770-650-11	CONNECTOR, FFC/FPC 22P	
CN591	1-506-468-11	PIN, CONNECTOR 3P	
* CN611	1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P	
* CN641	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P	

< DIODE >

D501	8-719-200-02	DIODE	10E2
D502	8-719-200-02	DIODE	10E2
D503	8-719-200-02	DIODE	10E2
D504	8-719-200-02	DIODE	10E2
D505	8-719-200-02	DIODE	10E2
D506	8-719-017-58	DIODE	MA8068
D507	8-719-801-78	DIODE	1SS184
D508	8-719-422-43	DIODE	MA8051-H
D521	8-719-801-78	DIODE	1SS184
D523	8-719-016-74	DIODE	1SS352
D532	8-719-056-15	DIODE	F01J4L
D533	8-719-056-15	DIODE	F01J4L
D536	8-719-016-74	DIODE	1SS352
D537	8-719-016-74	DIODE	1SS352
D581	8-719-820-05	DIODE	1SS181
D582	8-719-016-74	DIODE	1SS352

< GROUD PLATE >

* EB501	4-962-200-01	PLATE (TR), GROUND

< IC >

IC501	8-759-633-42	IC	M5293L
IC511	8-759-274-37	IC	BA3963
IC521	8-759-233-64	IC	TC74HCU04AF
IC531	8-759-327-15	IC	M62005L
IC541	8-759-290-19	IC	BA3960
IC571	8-759-636-55	IC	M5218AFP
IC591	8-759-636-55	IC	M5218AFP
IC621	8-749-921-12	IC	GP1F32T
IC622	8-749-011-65	IC	GP1F32RX
IC623	8-759-243-19	IC	TC7SU04F
IC671	8-759-636-55	IC	M5218AFP

< JACK >

J581	1-573-520-11	JACK, PIN 4P (LINE IN/OUT)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

POWER | POWER SW | REC

Ref. No.	Part No.	Description				Remark
		< COIL >				
L621	1-414-233-21	BEAD, FERRITE (CHIP)				
L623	1-410-389-31	INDUCTOR CHIP	47uH			
		< LINE FILTER >				
⚠LF641	1-411-547-11	COIL, LINE FILTER				
		< TRANSISTOR >				
Q581	8-729-901-46	TRANSISTOR	DTA114YK			
Q583	8-729-023-22	TRANSISTOR	2SD2114K			
Q584	8-729-023-22	TRANSISTOR	2SD2114K			
		< RESISTOR >				
R501	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R502	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R503	1-216-037-00	METAL CHIP	330	5%	1/10W	
R504	1-216-037-00	METAL CHIP	330	5%	1/10W	
R506	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R507	1-216-037-00	METAL CHIP	330	5%	1/10W	
R508	1-216-037-00	METAL CHIP	330	5%	1/10W	
R521	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R522	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R523	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R524	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R525	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R526	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R533	1-216-170-00	METAL GLAZE	68	5%	1/8W	
R534	1-216-170-00	METAL GLAZE	68	5%	1/8W	
R541	1-208-806-11	METAL CHIP	10K	0.50%	1/10W	
R542	1-208-810-11	METAL CHIP	15K	0.50%	1/10W	
R543	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R544	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R571	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R572	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R573	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R574	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W	
R575	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R576	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R577	1-216-647-11	METAL CHIP	680	0.5%	1/10W	
R578	1-216-647-11	METAL CHIP	680	0.5%	1/10W	
R579	1-216-639-11	METAL CHIP	330	0.5%	1/10W	
R580	1-216-639-11	METAL CHIP	330	0.5%	1/10W	
R582	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R583	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R584	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R591	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R592	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R593	1-216-037-00	METAL CHIP	330	5%	1/10W	
R594	1-216-037-00	METAL CHIP	330	5%	1/10W	
R603	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R604	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R605	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R606	1-216-166-00	METAL GLAZE	47	5%	1/8W	
R611	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R612	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	
R616	1-216-295-91	CONDUCTOR, CHIP				
R621	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R622	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R634	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R671	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R672	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R675	1-216-105-91	METAL CHIP	220K	5%	1/10W	
R676	1-216-105-91	METAL CHIP	220K	5%	1/10W	
**********						
*	1-654-135-11	POWER SW BOARD				
		**********				
		< CONNECTOR >				
CN742	1-766-203-11	PLUG, CONNECTOR PIN(PC BOARD)	5P			
		< DIODE >				
D701	8-719-313-40	LED	SML1516W (ON/STANDBY)			
		< TRANSISTOR >				
Q701	8-729-900-61	TRANSISTOR	DTA114ES			
		< RESISTOR >				
R701	1-249-429-11	CARBON	10K	5%	1/4W	
R702	1-249-429-11	CARBON	10K	5%	1/4W	
R711	1-249-411-11	CARBON	330	5%	1/4W	
R712	1-249-415-11	CARBON	680	5%	1/4W	
R764	1-249-425-11	CARBON	4.7K	5%	1/4W	
		< SWITCH >				
S703	1-762-234-11	SWITCH, SLIDE (TIMER)				
S764	1-554-303-21	SWITCH, TACTILE (POWER)				
**********						
*	1-654-134-11	REC BOARD				
		*********				
		< CONNECTOR >				
CN752	1-766-805-11	CONNECTOR, BOARD TO BOARD	3P			
		< RESISTOR >				
R706	1-249-417-11	CARBON	1K	5%	1/4W	
R707	1-249-429-11	CARBON	10K	5%	1/4W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV702	1-223-762-11	RES, VAR, CARBON 20K/20K (REC LEVEL)	
		< SWITCH >	
S702	1-572-624-11	SWITCH, SLIDE (INPUT)	
**********			
		MISCELLANEOUS	
		**********	
19	1-776-015-11	WIRE (FLAT TYPE) (22 CORE)	
52	1-776-417-11	WIRE (FLAT TYPE) (18 CORE) (100 mm)	
53	1-776-416-11	WIRE (FLAT TYPE) (30 CORE) (100 mm)	
54	1-769-123-11	WIRE (FLAT TYPE) (22 CORE)	
⚠57	1-696-586-21	CORD, POWER (UK)	
⚠58	1-575-651-21	CORD, POWER (AEP)	
⚠157	8-583-009-11	OPTICAL PICK-UP KMS-210A/J-N	
HR901	1-500-175-11	HEAD, OVER LIGHT (RF322-74A)	
M101	A-4660-651-A	MOTOR ASSY (SLED)	
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)	
⚠TR641	1-427-898-11	TRANSFORMER, POWER	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

English
95K097555-1
Printed in Germany
© 1995. 11

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

9-960-354-81

Published by Home A&V Products Div.
Quality Engineering Dept.

MDS-303

SONY

AEP Model
UK Model

SERVICE MANUAL

SUPPLEMENT-2

File this supplement with the service manual.

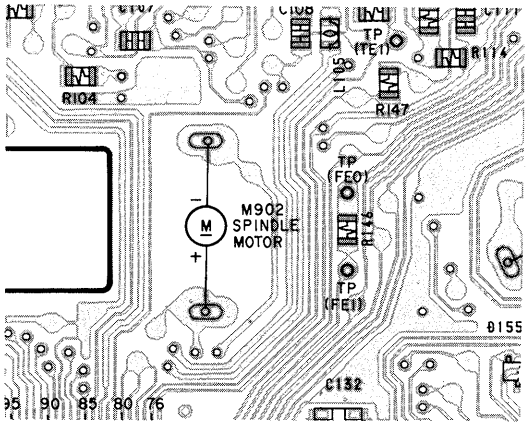
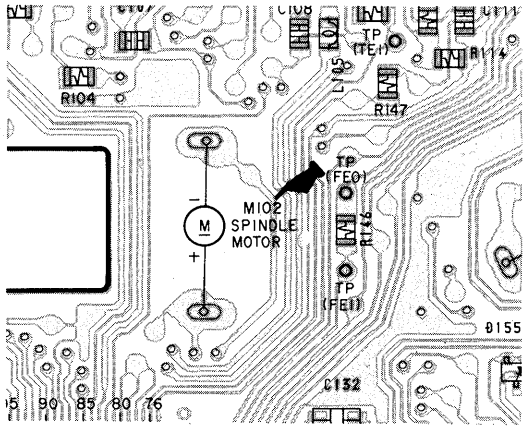
Subject : 1. CORRECTION
2. CHANGE OF OVER WRITE HEAD
3. PARTS CHANGED
4. CHANGE OF MECHANISM DECK

(ECN-CD600402)

1. CORRECTION

• Correct your service manual as shown below.

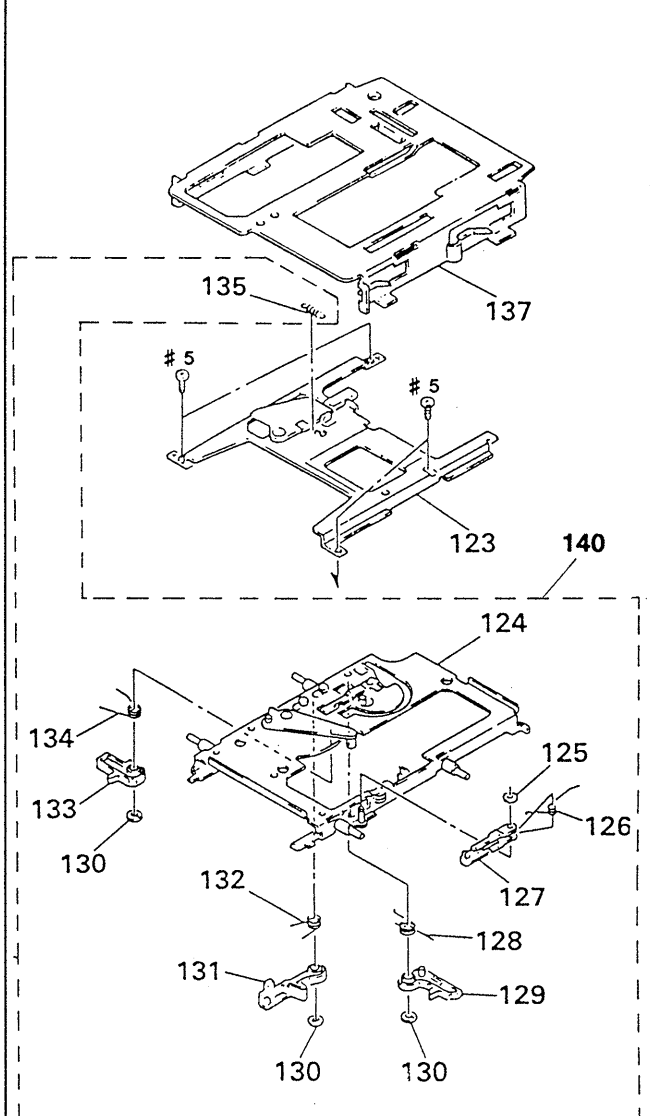
: Indicates corrected portion

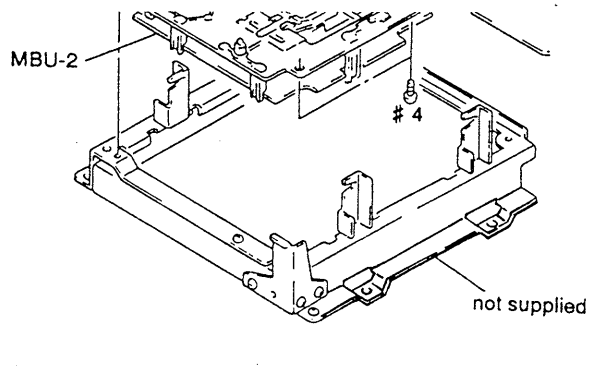
Page	INCORRECT	CORRECT
(10)	**[BD BOARD]** Location : E-10 	**[BD BOARD]** Location : E-10 

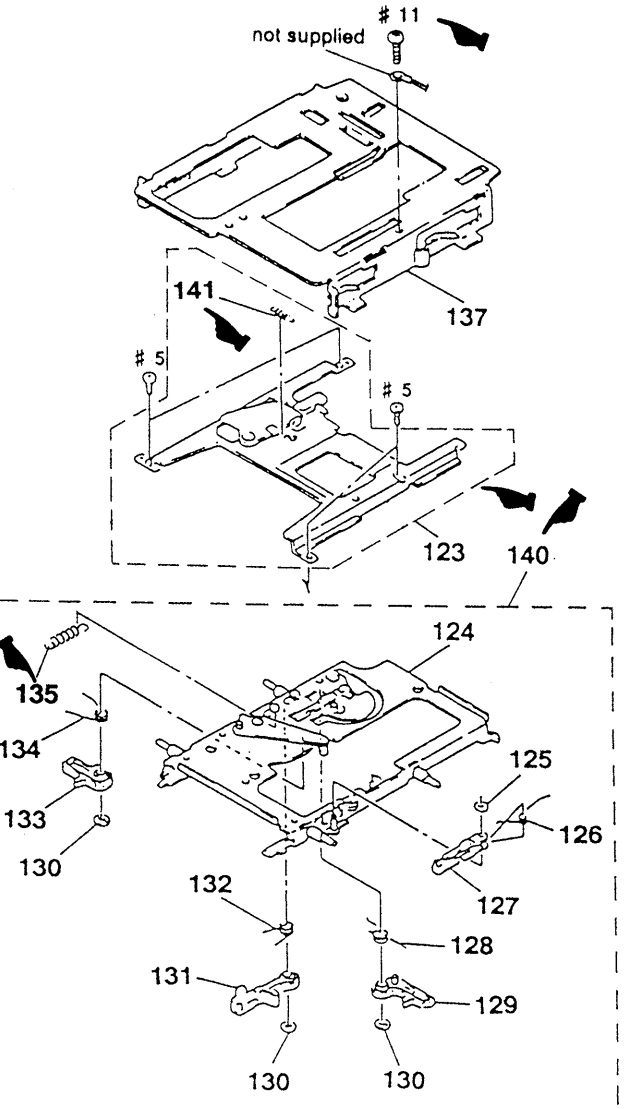
NOTE : The page number in parentheses corresponds to the Supplement-1.

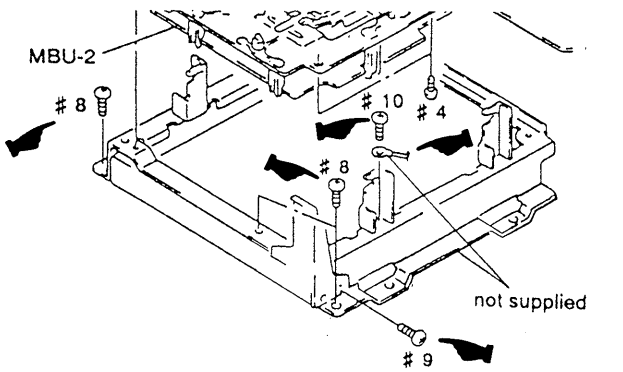
: Indicates corrected portion

Page	INCORRECT				CORRECT			
	Ref No.	Part No.	Description	Remark	Ref No.	Part No.	Description	Remark
			*** EXPLODED VIEWS ***				*** EXPLODED VIEWS ***	
70					141	4-967-664-05	SPRING, TENSION	
80					#9	7-685-862-09	SCREW +BVTT 2.6x6 (S)	
					#10	7-685-860-09	SCREW +BVTT 2.6x4 (S)	
					#11	7-685-781-09	SCREW +PTT 2x4 (S)	







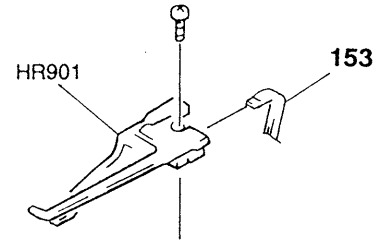


2. CHANGE OF OVER WRITE HEAD

The over write head has changed.
According to this change, the service form will be changed, so refer to How to discriminate (Over write head).

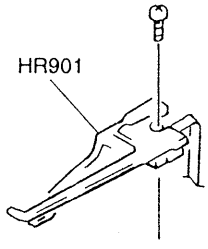
How to discriminate (Over write head)

FORMER TYPE

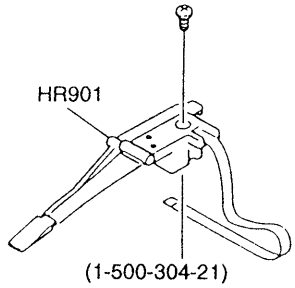


Ref No.	Part No.	Description	Remark
153	1-654-446-11	OWH FLEXIBLE BOARD	
HR901	1-500-175-11	HEAD, OVER WRITE (RF322-74A)	

NEW TYPE



(1-500-175-21)

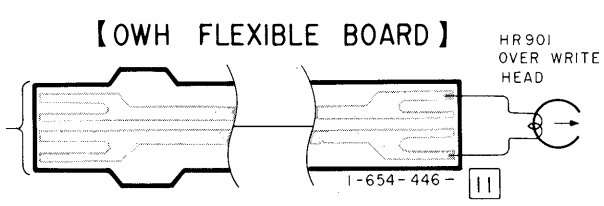
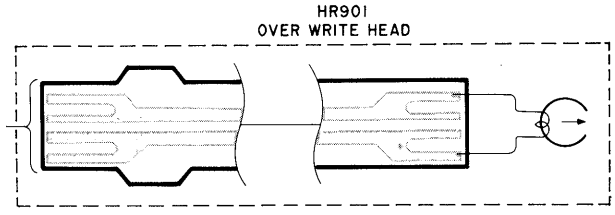
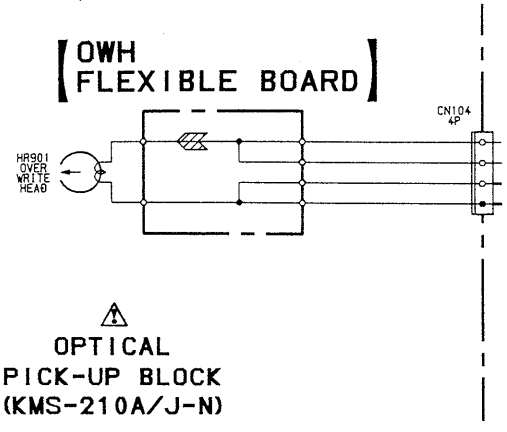
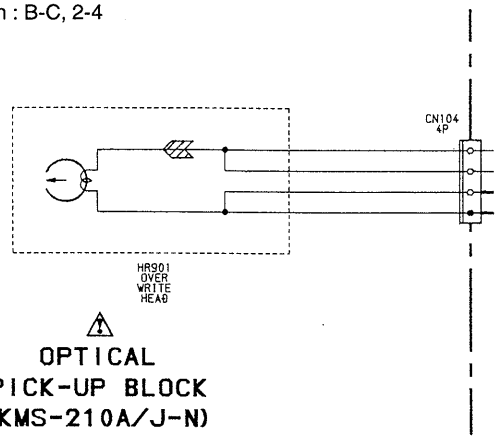


(1-500-304-21)

Ref No.	Part No.	Description	Remark
		not used	
HR901	1-500-175-21	HEAD, OVER WRITE (RF322-74A)	
		or	
HR901	1-500-304-21	HEAD, OVER WRITE	

The new part can be used instead of the former over write head. There are two new types which are available to use.

Difference table

Page	FORMER TYPE	NEW TYPE
(9)	Location : A, 4-6 	Location : A, 4-6 
(11)	Location : B-C, 2-4 	Location : B-C, 2-4 

	Ref No.	Part No.	Description	Remark	Ref No.	Part No.	Description	Remark
71			*** EXPLODED VIEWS ***				*** EXPLODED VIEWS ***	
	153	1-654-446-11	OWH FLEXIBLE BOARD				not used	
	HR901	1-500-175-11	HEAD, OVER WRITE (RF322-74A)		HR901	1-500-175-21	HEAD, OVER WRITE (RF322-74A)	
							or	
					HR901	1-500-304-21	HEAD, OVER WRITE	
80			*** MISCELLANEOUS ***				*** MISCELLANEOUS ***	
	153	1-654-446-11	OWH FLEXIBLE BOARD				not used	
	HR901	1-500-175-11	HEAD, OVER WRITE (RF322-74A)		HR901	1-500-175-21	HEAD, OVER WRITE (RF322-74A)	
							or	
					HR901	1-500-304-21	HEAD, OVER WRITE	

NOTE : The page number in parentheses corresponds to the Supplement-1.

3. PARTS CHANGED

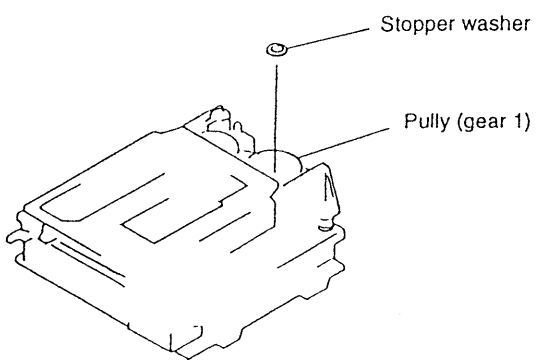
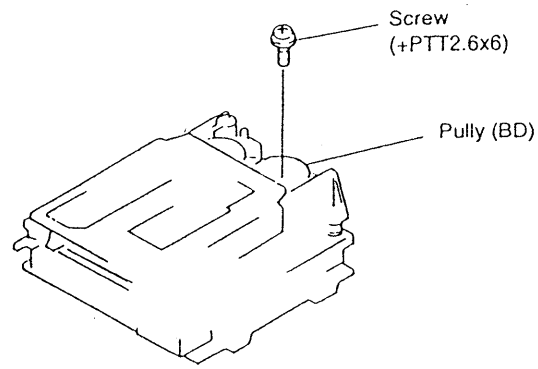
Page	FORMER				NEW			
	Ref No.	Part No.	Description	Remark	Ref No.	Part No.	Description	Remark
			*** EXPLODED VIEWS ***				*** EXPLODED VIEWS ***	
72	101	4-967-672-01	COLLAR (DAMPER)		101	4-983-100-01	COLLAR (DAMPER) * NOTE	

* NOTE : The new part can be used instead of the former Coller (Damper).

4. CHANGE OF MECHANISM DECK

The mechanism deck has been changed from MDM-2A to MDM-2AR.
Refer to How to discriminate (Mechanism deck) so that there is no interchangeability between MDM-2A and MDM-2AR.

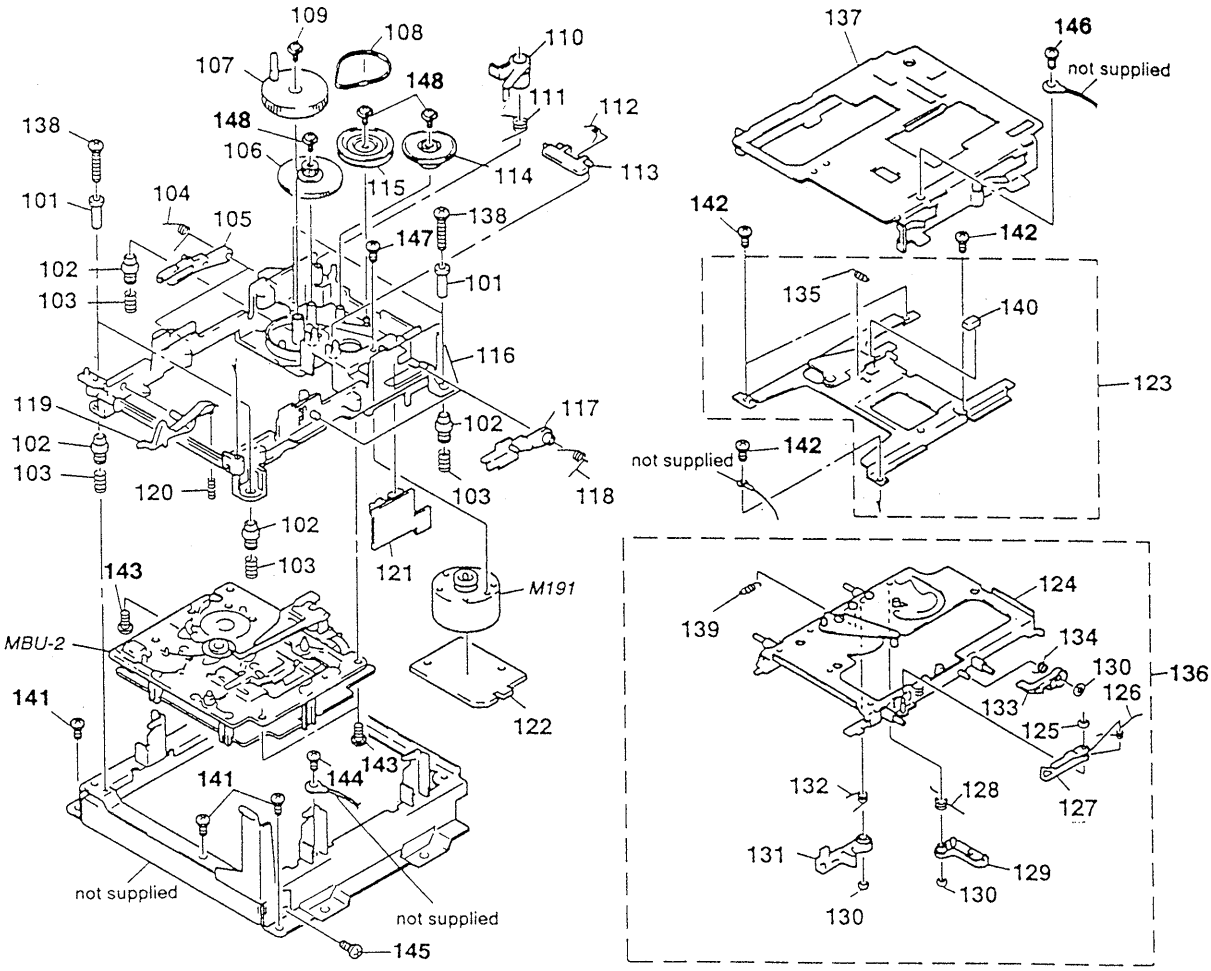
How to discriminate (Mechanism deck)

FORMER TYPE (MDM-2A)	NEW TYPE (MDM-2AR)
	

NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

MD MECHANISM SECTION (MDM-2AR)



Ref. No.	Part No.	Description	Remark
101	4-983-100-01	COLLAR (DAMPER)	
102	4-967-671-01	INSULATOR	
103	4-967-673-01	SPRING, COMPRESSION	
104	4-967-668-01	SPRING (UDL), TORSION	
105	4-967-667-01	LEVER (UDL)	
106	4-977-610-01	GEAR (BD-B)	
107	X-4945-069-1	CAM ASSY	
108	4-967-656-01	BELT (BD)	
109	4-933-134-01	SCREW (+PTPWH M2.6X6)	
110	4-967-637-01	LEVER (SLM)	
111	4-984-426-01	SPRING (SLM), TORSION	
112	4-968-273-01	SPRING (OWH), TORSION	
113	4-968-272-01	LEVER (OWH)	
114	4-977-609-01	GEAR (BD-A)	
115	4-977-608-01	PULLEY (BD)	
116	4-977-777-01	BASE (BD)	
117	4-967-669-01	LEVER (UDR)	
118	4-967-670-01	SPRING (UDR), TORSION	
119	4-979-400-01	LEVER (DOOR)	
120	4-970-710-01	SPRING, COMPRESSION	
* 121	1-653-411-11	DETECTION SW BOARD	
* 122	1-653-412-11	MOTOR BOARD	
123	A-4672-087-A	BRACKET (LVO) ASSY	
124	X-4947-136-2	HOLDER ASSY	
125	4-968-919-11	WASHER, STOPPER	

Ref. No.	Part No.	Description	Remark
126	4-967-646-01	SPRING (SHT), TORSION	
127	4-967-645-01	LEVER (SHT)	
128	4-983-106-02	SPRING (LM), TORSION	
129	4-967-639-01	LEVER (LM)	
130	4-968-919-01	WASHER, STOPPER	
131	4-967-641-01	LEVER (L)	
132	4-967-642-01	SPRING (L), TORSION	
133	4-982-040-01	LEVER (LOCK)	
134	4-982-099-01	SPRING (LOCK), TORSION	
135	4-967-664-05	SPRING, TENSION	
136	A-4672-071-B	HOLDER COMPLETE ASSY	
* 137	X-4945-872-1	SLIDER (M) ASSY	
138	4-972-910-01	SCREW (2.6X18), +B	
139	4-971-743-02	SPRING, TENSION	
140	4-983-110-01	CUSHION (LVO)	
141	7-685-871-01	SCREW +BVTT 3X6 (S)	
142	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT	
143	7-685-645-79	SCREW +BVTP 3X6 TYPE2 N-S	
144	7-621-773-86	SCREW +BVTT 2.6X4 (S)	
145	7-685-862-09	SCREW +BVTT 2.6X6 (S)	
146	7-621-255-25	SCREW +PTT 2X4 (S)	
147	7-621-775-20	SCREW +B 2.6X5	
148	7-621-770-67	SCREW +PWH 2.6X6 (S)	
M191	A-4660-646-A	MOTOR (LOADING) ASSY	

9-960-354-83

Sony Corporation
Home A&V Products Company

97A097553-1
Printed in Germany © 1997. 1
Published by Service and Safety
Engineering Dept. (Shibaura)